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T H E S I S

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on

G A S T R I C C A R C I N O M A

MAINLY in RELATION to its EARLIER RECOGNITION and
CONSEQUENT RADICAL TREATMENT

by

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GASTRIC CARCINOMA
MAINLY IN RELATION TO ITS EARLIER RECOGNITION and
CONSEQUENT RADICAL TREATMENT.

In the great fields of Medical and Surgical Diagnosis, there are two subjects which have always appeared to me to present to the ordinary general practitioner, no matter how skilled he may be, almost insuperable difficulty in their early recognition. I refer to Gastric Carcinoma and Acute Suppurative Osteomyelitis.* With the former of these, more especially its earlier recognition, it is my intention to deal in this Thesis. The presence of Gastric Carcinoma in the vast majority of cases is only suspected when a palpable epigastric tumour and, unfortunately, in some cases, a visible epigastric tumour is discovered. When one reflects that the common sites for such neoplasms to develop are towards the pylorus and on the lesser curvature (regions in health anatomically impalpable), it can readily be imagined that by the time such tumours are definitely/

* This latter disease I have seen so often disastrously diagnosed as "Acute Rheumatism" that the importance of its accurate and early diagnosis and immediate treatment is ever before me.

definitely, superficially palpable, not to mention visible, implication of surrounding important structures, glandular invasion, and secondary metastatic deposits, all too plainly account for the deplorable condition of the average patient who is sent to the surgeon for relief. Those "living skeletons", emaciated, sallow, feeble and anaemic, with subnormal temperature, lungs peculiarly susceptible to any chilling effect (the mere giving of an anaesthetic often hastening their end), with hearts enfeebled and tissues devitalised, cannot be expected to stand, and, as can be shown from the results of most surgeons, do not stand any operation performed with a view to cure, and frequently not even one performed merely with a view to palliate their distress.

The question then surely suggests itself - What can we do to correct or better this regrettable state of affairs?

Through the great kindness of Professor Caird (with whom I had the privilege of acting as House Surgeon during the Winter 1910-11) who has generously permitted me to make use of his case-books, I have been able to collect therefrom 200 cases of Gastric Carcinoma. These I have carefully analysed, and/

and they are submitted in tabulated form, along with this Thesis, for reference if need be. Twenty of these cases I personally had charge of during my period of office with Mr Caird, and several others I saw as a student in his wards. Others again I saw while a student in the Medical House in the Wards of Professor Sir Thomas R. Fraser and of Professor Wylie, with the latter of whom it was my good fortune to act as Clinical Assistant, and later (during the Winter 1909-10) as House Physician.

In the following Thesis, for brevity's sake and for the sake of clearness, I have ventured to term the above 200 cases on which I base my observations as "my series of cases". I have further thought fit* to divide these cases under the two headings:-

A. "GASTRIC"- embracing carcinomata in the region of the cardiac orifice, the fundus and the body of the organ. With regard to those affecting the cardiac orifice, I have not discussed whether they were primarily oesophageal or gastric.

B. "PYLORIC" - embracing carcinomata of the pyloric antrum and region of the pyloric orifice.
I/

* On what I consider the valuable suggestion of Mr D.P.D. Wilkie, to whom I take this opportunity of expressing my thanks.

I have done so, as I think these two parts of the stomach are definite entities. The cardiac portion is merely a receptacle for food (I have called tumours arising here "gastric" to avoid the term "cardiac" as this might lead to confusion - the orifice merely being usually referred to); whilst the pyloric portion is the active grinding part. The latter is the common site of simple peptic ulcer which would appear to play a considerable role in the etiology of many cases of carcinoma of the stomach.

E T I O L O G Y.

I. INCIDENCE.

Professor Osler (1) in his "Principles and Practice of Medicine" writes:-

"In an analysis of 30,000 cases of cancer, W.H. Welch found the stomach involved in 21.4 per cent, this organ standing next to the uterus in order of frequency. Among 8,464 cases admitted to my wards, there were 150 cases of cancer of the stomach. There were 39 cases among the first 1,000 autopsies in the post-mortem room of the Johns Hopkins Hospital. The disease is more common in some countries. Figures indicate that cancer of the stomach, as/

as of other organs, is increasing in frequency."

Hale White (2) writes that -

"the stomach is a very common seat of primary malignant disease, which is nearly always carcinomatous: no organ in the body is more frequently affected; indeed in nearly half of all the cases of carcinoma the primary seat of disease is in the stomach. I find at Guy's Hospital that in the ten years 1886-96 it caused the death of 60 patients, that is to say in hospital practice, it is responsible for 1.5 per cent of all deaths." Elsewhere he contends that "primary carcinoma is the most frequent and important of the tumours of the stomach and the only form of common clinical interest;" and further he states that "there is no trustworthy evidence as to whether cancer of the stomach is increasing in frequency."

Mayo Robson (3) says the stomach is invaded by cancer more frequently than any other organ accessible to direct observation. He further says -

"As regards the frequency of carcinoma of the stomach, Dr C.N.Dowd (Medical Record, 1906) called attention to the fact that according to the census reports there were no less than 9000 deaths from cancer of the stomach in the United States in 1900, and/

and of these very few had been submitted to surgical treatment. I find on referring to the Registrar General's report for England and Wales that during the years 1901-1904 no less than 19,607 deaths from cancer of the stomach were registered, equal to 4,901 per annum. Professor Osler has pointed out that in the years 1901-1905, while there were 24,750 deaths from cancer of the stomach, there were only 19,675 from cancer of the uterus, and 14,418 from cancer of the breast."

Boardman Reed (4) says -

"nearly one-half of all cancers, according to Riegel, involve the stomach;" and again, "one per cent of all deaths result from gastric cancer."

Dr. William Gordon (5) states that -

"by far the commonest of all cancers are cancer of the stomach in both sexes and cancer of the uterus and breast in women."

According to Savill (6) -

"The stomach is a frequent site of primary cancer. It has been found in one per cent of all post-mortems."

I find that of the 396 admissions to Mr. Caird's wards during the Winter 1910-11, there were 73 cases of Malignant Disease. Of these 67 were cases/

cases of Carcinoma, and of the latter 46 affected the Alimentary Tract. Of the 46 last named, 20 affected the stomach, and it is to these 20 cases that I have referred already as having come under my care as House-Surgeon.

II. SEX.

Professor Osler writes -

"T. McCrae has analysed 150 cases from my wards and found that there were 126 males and 24 females. Welch gives the ratio as 5 to 4."

Taylor (7) contends that: -
"sex has no appreciable influence," and Boardman Reed says the sexes are equally subject.

Bain (8) and Savill maintain that the disease is more common in males than in females; and Fagge (9) states that of 43 cases coming under his notice, 30 were males, and 13 were females, figures which he says, correspond pretty closely with Dr. Brinton's estimate, though curiously enough he states that certain writers maintain that the disease is more common in women than in men.

According to Hale White; -

"authors are agreed that it is commoner in men than/

than in women; some give the proportion as 3 to 2; others as 2 to 1; Sir C. Perry and Dr. Shaw give the proportion as 5 to 2, and it is important to remember that all their cases were examined after death."

In my series of 200 cases, there were 122 males or 61 per cent, and 78 females or 39 per cent. I have heard it called a 'male disease'. The occurrence of the disease here in so many females is rather striking.

I here give an analysis of the cases, subdivided into "gastric" and "pyloric", as indicated at the outset: -

Of the 49 "gastric" cases, 30 were males, 19 were females.

Of the males, there was none under 30 years of age.

Between 31 and 40 years of age, there were	5 cases.
" 41 " 50 " " " " "	6 " .
" 51 " 60 " " " " "	13 " .
" 61 " 70 " " " " "	6 " .
	<u>30</u>

The commonest age here, apparently, is 50-60.

Of/

Of course, that the correct age is given in females is generally admitted.

Of the females, there was 1 case under 30 years of age - namely K.H. aet. 22 (see special mention).

Between 31 and 40 years of age,	there were	3 cases.
" 41 " 50 " " " , " "	4 " .	
" 51 " 60 " " " , " "	6 " .	
" 61 " 70 " " " , " "	5 " .	
	<u>19</u>	

The commonest age here, apparently, is 50-60.

Of the 151 "pyloric" cases, 92 were males, 59 were females.

Of the males, there were: -

Between 20 and 30 years of age	2 cases.
" 31 " 40 " " " 10 " .	
" 41 " 50 " " " 25 " .	
" 51 " 60 " " " 39 " .	
" 61 " 70 " " " 14 " .	
" 71 " 80 " " " 2 " .	
	<u>92</u>

The commonest age here, apparently, is 50-60

Of the females; -

There was between 20 and 30 years of age	1 case.
" were " 31 " 40 " " " 9 cases.	
" " " 41 " 50 " " " 29 " .	
" " " 51 " 60 " " " 11 " .	
" " " 61 " 70 " " " 9 " .	
	<u>59</u>

The commonest age here, apparently, is 40 to 50. It is quite marked - granting, of course, that the correct age is given! As females are, it is generally admitted/

admitted, more prone to gastric ulcer, would the possibility of the supervention of carcinoma on an old ulcer, in these cases, not explain the occurrence of the former disease at an earlier decade?

III. A G E.

Of Osler's 150 cases, the ages were as follows: -

Between 20 and 30	6 cases.
" 30 " 40	17 " .
" 40 " 50	38 " .
" 50 " 60	49 " .
" 60 " 70	38 " .
" 70 " 80	4 " .

58 per cent occurred between the ages of 40 and 60.

Of the 6 cases occurring under the thirteenth^{1e} year the youngest was 22. He mentions that of the large number of cases analysed by Welch 75 per cent occurred between the 40th. and 70th. years, and he further says that "congenital cancer of the stomach has been described, and cases have been met with in children."

According to Taylor: -

"Cancer of the stomach is rarely seen before the age of thirty, and the majority of cases occur between forty and sixty."

Hale White says: -

"It/

"It is a disease of the later half of life. Perry and Shaw found the average age at death to be 52.1 years. Of their cases, all examined histologically, the youngest sufferer from carcinoma of the stomach was 32 and the oldest 81. According to Brinton, three-fourths of the cases occur between 40 and 70; between 40 and 50 is, according to Perry and Shaw who analysed 283 cases, the most fatal decade, but that between 50 and 60 is almost as fatal; probably the age at death is a little later now than it was, for in some cases life has been undoubtedly prolonged by short-circuiting. About 2.5 per cent of the cases occur between 20 and 30. The average age at death is a little earlier with women than men. It has been alleged that sometimes cancer of the stomach is met with in young subjects; but it is very probable that some, at least, of these cases were instances of sarcoma, for among Perry and Shaw's series of 48 cases, all examined histologically, no case of cancer occurred in a patient younger than 32; but of four cases of sarcoma, one patient was 15 and another 18 years of age/

age. Dr. Norman Moore, however, has recorded an undoubted case of carcinoma of the stomach in a girl aet. 13, and Osler and McCrae were only able to find records of 13 cases in the second decade - of these Dr. Moore's was the youngest; under 10 years of age they collected 6 cases only, and about some of these there was considerable doubt."

Fagge contends that most cases occur over the age of 40, and states that of 46 cases, 11 patients only were under the age of 40, while of the remaining 35, 16 were between 41 and 50; 11 were between 51 and 60; and 8 were between 61 and 70 - figures which, he mentions, correspond generally with those quoted by Dr. Brinton.

Savill states that the disease is rarely met with under 40, though he has seen a case of 28, another of 30, and several between 30 and 40.

According to Bain, the disease occurs at middle age - usually between 50 and 60.

Canney (10) reports a case of carcinoma of the stomach in a youth of 19.

Cheney, says Herschell (11), reported that of 150 cases, 20 were under 30, and 17 between 30 and 40 years of age.

In/

In my series of 200 cases there were: -

Between	20	and	30	4	cases.
"	30	"	40	28	"
"	40	"	50	63	"
"	50	"	60	69	"
"	60	"	70	34	"
"	70	"	80	2	"

66 per cent occurred between the ages of 40 and 60. Of the 4 cases occurring under the thirtieth year, the youngest was 22, the next being 23. Both of these - very interesting cases - came under my charge during my term of House Surgeonship.

The following is an analysis of my series of 200 cases, subdivided as before described: -

Of 42 "gastric" cases; -

There was	1	between	20	and	30.
"	were	8	"	30	" 40.
"	"	10	"	40	" 50.
"	"	19	"	50	" 60.
"	"	<u>11</u>	"	60	" 70.
		<u>49</u>			

or, roughly; -

Between	20	and	30	2%.
"	30	"	40	16%.
"	40	"	50	20%.
"	50	"	60	32%.
"	60	"	70	22%.

Of 151 "Pyloric" cases; -

There/

There were	3	between 20 and 30.
" "	20	" 30 " 40.
" "	53	" 40 " 50.
" "	50	" 50 " 60.
" "	23	" 60 " 70.
" "	2	" 70 " 80.
	<u>151</u>	

or, roughly -

Between 20 and 30	2%.
" 30 " 40	13%.
" 40 " 50	35%.
" 50 " 60	33%.
" 60 " 70	15%.
" 70 " 80	1%.

Founding on these figures, one would conclude -

- (a) That carcinoma of these two parts of the gastric organ is equally common between the ages of 20 and 30.
- (b) That 'gastric' carcinoma as opposed to 'pyloric' is slightly more common between 30 and 40.
- (c) That 'pyloric' carcinoma as opposed to 'gastric' is much commoner between 40 and 50.
- (d) That 'gastric' carcinoma as opposed to 'pyloric' is slightly more common between 50 and 60.
- (e) That 'gastric' carcinoma as opposed to 'pyloric' is more common between 60 and 70.
- (f) That 'pyloric' carcinoma as opposed to 'gastric' is more common over 70.

always/

always, of course, remembering that we are dealing with only 49 'gastric' out of 200 cases, and, moreover, that to talk of percentages is perhaps not quite justified.

The above analysis supports the general assumption that carcinoma of the stomach occurs generally after the fortieth year and between 40 and 60, the figures showing: -

Of the "gastric cases"	80%	over 40.
" " "pyloric"	" " 84%	" " "

and further: -

Of the "gastric cases"	58%	between 40 and 60.
" " "pyloric cases"	68%	" " " "

From the foregoing analyses it will also be seen that, as in the case of tubercular disease (which, I fear, is too commonly ascribed to the three earlier decades), carcinoma of the stomach may occur at almost any age, though, it is true, by far its greatest age incidence is between 40 and 60. Its very marked diminution in cases over 70 is due, of course, to the comparatively small number of even healthy subjects surviving that advanced period, and to the fact that those with a predisposition to gastric carcinoma (if such a thing there be) would be almost certain/

certain to develop the disease before attaining that age.

IV. R A C E.

Of Osler's 150 cases, 131 were white; 19 were negroes.

Hale White says: - "Probably cancer of the stomach is rarer in negroes than in white people."

V. H E R E D I T Y.

Of Osler's 150 cases, in only 11 was there a positive history of cancer in the family. And to quote Taylor: -

"though there can be little doubt that cancer in general is to a certain extent hereditary, this is not a prominent feature of cancer of the stomach. Lebert gives seven per cent as the proportion of cases that can be attributed to hereditary influence."

Hale White says: -

"There is no evidence..... that heredity plays any part," and Fagge had doubts as to the influence of heredity.

Boardman Reed, on the other hand, states that heredity -

"has been shown to have some effect; i.e. the tendency to it is often inherited and traumatism or/

or irritations frequently seem to exert a causative influence."

Savill likewise states that hereditary influence often exists. In my series of 200 cases a definite family history of carcinoma was obtained in 28, or 14 per cent. Of these, in 2 there was a family history of 3 cases of malignancy (e.g. father died aet. 84, - cancer of bladder; one sister died aet. 57, - cancer of stomach; another sister died aet. 52, - cancer of breast). In 6 (in one of which there was a doubtful third case) there was a history of 2 cases of malignancy; and in 20 (in one of which there was a doubtful second case) there was a history of one instance of malignancy.

In 17 other cases, very suspicious statements; such as "Mother died aet. 74 of abdominal tumour" were obtained. In other cases, all aged about 50, doubtful information was forthcoming, for example, 'stomach trouble', 'ulcer of stomach', 'wasting', 'jaundice', 'ascites', 'inflammation of the bowels', 'intestinal obstruction'.

Were we to take it that 10 of these doubtful cases were carcinomatous, it would work out that

38 out of the 200 were possible malignant family histories, or 19 per cent. Even the definite 14 per cent however, is almost double the number quoted in the statistics furnished by Osler and Lebert. The excess may be due in large measure to the fact that very careful histories, I may say exceptionally careful, were procured in my series, occurring as they did in a teaching hospital, which perhaps did not obtain in the case of the two authorities cited. It is of interest that many were cases of gastric and intestinal carcinoma.

Certain authorities have seemingly sought to link the disease with tubercular disease - Osler mentions that in his series of 150 cases, 38 had a family history of tuberculosis.

Hale White says: -

"Occasionally we see carcinoma in a patient affected with phthisis, but I do not know that this association is especially marked when the cancer grows in the stomach."

In my series of 200 cases, it was not an especial feature. With regard to Hale White's assertion that carcinoma is found in conjunction with phthisis/

phthisis, it is quite conceivable that the tubercle bacillus finds in the depraved tissues of the cancerous subject a suitable nidus for its growth and development, and that the carcinoma is a priori the real primary disease.

VI. OCCUPATION AND SOCIAL CONDITIONS.

To quote Taylor; -

"It is equally frequent among the rich and the poor, and is not related to any particular occupation."

As practically all of my 200 cases were "hospital" patients, one cannot speak as to its occurrence with equal frequency among the rich and the poor, but if one were asked definitely which section of the community produced most cases of gastric carcinoma, one would reply "the poor", at least I rather think so. The occurrence of carcinoma of the uterus in women who have had large families and in the humbler walks of life is well known.

As to occupation, one can say nothing, but it is noteworthy that several painters and fishermen suffered from the disease.

Of the 78 females, 67 were married women.

VII/

VII. H A B I T S.

Of Osler's 150 cases, 77 are stated to have used alcohol regularly, 65 moderately (?), and 8 to excess.

Of my series, 139, or 69.5 per cent had used alcohol regularly - 117 of them moderately (?), and 22 to excess.

Of those who admittedly took to excess, several took undiluted whiskey regularly. Several, too, it may be mentioned, were workers in breweries. With regard to those engaged in this occupation, Sir Alfred Pearce Gould (12) draws attention to statistics drawn up by Dr. Tatham showing the prevalence of cancer among brewers and London publicans and laying stress on the fact "that the cancer incidence in any trade varies with the attendant habits as regards alcohol."

The great majority of those (in my series) using alcohol were, in both "gastric" and "pyloric" divisions, males.

VIII. P R E V I O U S D I S E A S E S.

(a) TRAUMA. Osler mentions a solitary case, in his series of 150, giving a positive history of trauma/

trauma; and refers to a case where cancer followed rapidly upon a blow upon the stomach, the patient losing 60 pounds in weight in 3 months.

Hale White contends that "there is no evidence that trauma," or that "any particular food, or chronic indigestion lead to cancer of the stomach."

One of my series, a male aged 32, gave a history of trauma - two months before. That was the beginning of the illness, and as he was losing weight, he was sent to a sanatorium! Operation later revealed a carcinoma. (Pp. 227 & 229).

- (b) PREVIOUS GASTRIC SYMPTOMS. In Osler's 150 cases "a history of dyspepsia was present in only 33 cases; of these, 17 had had attacks at intervals, 11 had had chronic stomach trouble, and 5 had had dyspepsia for one or two years before the symptoms of cancer developed" and he introduces the case of Napoleon who "had always had a stomach of iron and felt no inconvenience until the onset of what proved to be his fatal illness."

*Was then a
Case of Car-
cinoma or
a fibrin
Ulcerating
& ulcer
(Gumdy)*

Hale White, as has just been seen above, maintains/

maintains that there is no evidence that "chronic indigestion" leads to cancer of the stomach.

In my series a history of dyspepsia was present in 30 cases; of these 18 were "pyloric", and 12 were "gastric". Of the 18 "pyloric" cases 16, and of the 12 "gastric" cases 8 had had chronic stomach trouble. The 16 "pyloric" cases consisted of 9 males and 7 females. Among the various complaints were "indigestion all their lives", definite haematemesis or melaena, and acute pain, the patients being treated for weeks for "ulceration". The 8 "gastric" cases consisted of 5 males and 3 females, the symptoms shown being practically the same as in the "pyloric" cases. Many of the patients dated their complaint back "as far as they could remember." The remaining 2 "pyloric" cases and the remaining 4 "gastric" cases had had dyspepsia for one or two years before the symptoms of cancer developed. Some of these began with an attack of haematemesis and had recovered for a little (6 to 18 months) but had then gone downhill. It is difficult to say whether or not these were the first signs of carcinoma, but as the weight had only fallen within the last year of their illness it is possible that they were rapid cases superimposed on ulcer.

Below/

Below is appended a table of cases in which a suggestive history of old ulcer was present.

" P Y L O R I C " C A S E S .

Sex & Age.	Date of Haematemesis before Admission.	Date of Melæna before Admission.	Continuance of Indigestion.	Remarks.
1 Male 53	11 years		-	-
2 Female 59	-	6 years 7 years (and repeated).	-	-
3 " 48	-	4 years	-	-
4 Male 52	8 years	-	-	-
5 " 64	14 years	-	5 years	-
6 Female 43	4 years	-	20 years	-
7 Male 52	5 years	-	-	-
8 " 58	11 years	-	-	-
9 " 50	3 years	-	-	-
10 " 56	2 years	2 years	-	-
11 Female 52	4 years	4 years	-	-
12 " 37	7 years	-	20 years	-
13 " 43	24 years	-	-	-
14 " 68	30 years	-	-	-
15 " 35	8 years	-	-	-

Acute perforative case.
(6 months before admission 11 st.
(and well. On admission 9 st.
(18 months before admission 12 st.
(3 lbs. On admission 7 st. 7 lbs.

In/

In all of these 15 "pyloric" cases (7 males and 8 females) definite signs of ulceration were present, and in the majority of cases at a date long antecedent to the probable period of inception of the carcinoma, haematemesis in two of the cases having occurred 24 and 30 years previously.

"GASTRIC" CASES.

	Sex & Age.	Date of Haematemesis before Admission.	Date of Melaena before Admission.	Continuance of Indigestion.	Remarks.
1.	Male 64	-	38 years.	-	-
2.	Female 48	21 years	-	-	-

Thus two "gastric" cases only (1 male and 1 female) showed signs similar to those of the "pyloric" cases, 38 and 21 years previously to the probable inception of carcinoma.

Taking the groups together, we have 15 "pyloric" cases and 2 "gastric" cases, 17 in all out of 200 - or 8.5 per cent - with definite signs of ulceration before those of cancer were manifest.

One of the cases under present review had had a gastric ulcer excised 5 years before. He was then/

then 51. Touch suggested malignancy, but the pathological report stated that the condition was simple. Nevertheless, the patient returned emaciated and with secondary deposits and died soon after.

Reverting to Previous Diseases, one of my cases had a breast (right) removed for scirrhus 12 years before and 5 years later a hysterectomy for "tumour". She was aged 55, and the gastric condition found on exploration was inoperable; she died a week later.

Another had had a breast (right) removed for "tumour" one year before.

The foregoing tables are very interesting records in view of the great discussion as to the growth of carcinoma upon old peptic ulcer. Four of Osler's 150 cases gave a history pointing to ulcer. Taylor, though stating that it "frequently happens in those who have been hitherto quite healthy, and that it is not determined by any previous disease of the stomach," gives as the exception "ulcer, a few cases of which have been found in association with cancer, or actually themselves becoming cancerous." Savill says "simple ulcer and chronic gastritis appear to predispose."

"The only fact," says Hale White, writing on etiology, "that has been said to bear on it is that/

that some cases of gastric carcinoma grow from a simple ulcer," the percentage being given as between 5 and 9, but, he contends, "the last is certainly too high." If so, it may be answered, what can be the cause of so many cases of carcinoma of the stomach? If not previous disease in any form except perhaps in 7 per cent of the cases, what is the cause in the other 93 per cent?

"Osler and McCrae," says Hale White, "found no evidence that a gastric ulcer was especially liable to become the seat of a carcinoma. Fagge thought otherwise, and Perry and Shaw found simple ulcers in 9 per cent of the gastric carcinomas examined after death, although according to Welch's figures gastric ulcers, either active or healed, are only found in 5 per cent of all autopsies. This appears to show", continues Hale White, "that there is a slight special liability for gastric ulcers to become carcinomatous."

Here I would quote Mr. Stiles (13) who referring to "the grafting of malignant disease upon a chronic ulcer," declares it to be "a condition which experience gained from the operating theatre has shown/

shown to be much more common than was previously supposed."

Hale White again says - "some authors state that a large proportion of patients with gastric carcinoma have previously suffered from ulcer, but their conclusions depend on clinical histories, and I have elsewhere shown that many patients supposed to have a gastric ulcer have not. In Guy's Hospital Museum, there are two specimens of carcinoma beginning in a gastric ulcer; in both, the growth is a spheroidal-celled carcinoma; both patients were women, one aged 39, the other 65."

Now taking my series, 15 "pyloric" cases and 2 "gastric" cases - i.e. 17 out of 200 or 8.5 per cent gave histories of haematemesis or melaena with acute pain, at varying periods before the onset of cancerous symptoms - that is, probably, of ulceration in the "gastric" and "pyloric" regions -

1 case of two years.

1 case of three years.

3 cases of four years.

1 case of five years.

2 cases of seven years.

2/

2 cases of eight years.
 2 cases of eleven years.
 1 case of fourteen years.
 1 case of twenty-one years.
 1 case of twenty-four years.
 1 case of thirty years.
 1 case of thirty-eight years duration.

These seem to be definite cases, 8 males and 9 females. There were many others who had suggestive histories of ulcer - 13 in number - but no definite signs such as these mentioned, so that one would put down on the basis of history 8.5 as the smallest percentage of carcinoma following upon old ulcer.

If old ulcer leads to carcinoma, despite the great number of gastric ulcers which occur in young women - servant-maids from 18-25 for instance - gastric carcinoma is a markedly "male" disease. And again, gastric ulcer (used in its widest sense) is said not to be common in males, but a "pyloric" or "duodenal" ulcer (whether half an inch or an inch on one side or the other of the pylorus I will not discuss here). Yet, in the 49 "gastric" cases I am dealing/

dealing with, 30 were of males and 19 of females. By "gastric" I mean, as stated at the outset, cardiac, fundal and body cases. What was the cause of these 30 "male" cases? Who can tell?

Of the "pyloric" cases (151), 92 were males; 59 were females. This is not to be wondered at, seeing that a "female" ulcer most often is situated near the pylorus, on the posterior wall and towards the lesser curvature, and the "male", whether to the gastric or duodenal side of the pylorus will, if carcinoma develop upon it, give rise to much the same kind of tumour as to site i.e. pyloric. One will ask why if only 17 give definite histories of ulcer, and other 13 give histories of chronic indigestion - take them all as ulcer i.e. 30 out of 200 or 15 per cent - what was the cause of the condition in the other 85 per cent? A great number said that they had "never been ill before", "never had a doctor in their lives", "splendid stomachs", and that they "could digest anything" until their present trouble began - in most cases under a year. The causation of the disease is, like that of Eclampsia, a mystery. As in the case of the latter disease, numerous causes are/

are given, but we are not so fortunate in respect of diagnosis.

If Sherren (14) is to be believed, it is just as preventable - warnings are apparently in abundance!

He says, (and he is one of a school of many others), -

"Cases of carcinoma of the body of the stomach fall into three groups by the symptoms produced: -

- (i) Following previous gastric disease.
- (ii) Occurring in individuals with a previously 'clean' gastric history.
- (iii). Latent.

Dealing with the first group, he proceeds:-

"This is a most important group, and the one which is concerned with the prevention of gastric carcinoma. Physicians generally have been sceptical as to the possibility of malignant growth originating in chronic gastric ulcer, but among my cases were 36 with a history pointing to chronic gastric ulcer of over four years' duration, 18 of these were over five, 5 of twenty-five to twenty-eight, 1 of fifteen, and 1 of sixteen years' duration/

duration. The evidence, to my mind, admits of no doubt. Other surgeons have found higher percentages Robson 59 per cent and Moynihan 60 per cent. I have not included in these figures those cases in which there was a history suggestive of gastric ulcer many years previously, followed by years of good health. They include only those in which the symptoms extended over the periods named with the 'free intervals' which usually occur in cases of chronic ulcer. Had all cases with a history of previous gastric trouble been included my figures would approximate those given by Robson and Moynihan. Evidence has been obtained from the other side. Mumford and Stone traced 60 patients treated for chronic dyspepsia at the Massachusetts General Hospital. They found that 30 of them died from what was clinically carcinoma of the stomach. [We have not pathological evidence.] Of microscopical evidence, we have the work of Wilson and McCarty in the Mayos' clinic, who found on examining the specimens removed by partial gastrectomy that in 71 per cent there was evidence that the carcinoma had developed in chronic gastric ulcer.

It/

It will not be overstating the case if we conclude that considerably over a third of the cases of carcinoma of the stomach originate in chronic ulcers and are therefore 'preventable'. He gives two examples - women aet. 41 and 53 - chronic gastric ulcers of 28 and 10 years' duration respectively. The 28 year case was suitable for partial gastrectomy and left well; the 10 year case was inoperable.

"I could quote," he continues, "many similar cases in which serious gastric disease was diagnosed, treated by rest in bed, and relapsed, and yet surgical treatment was not undertaken until malignant disease had supervened. Had operation been carried out earlier there can be little doubt that the onset of malignant disease would have been prevented."

At the present time, even the physician most opposed to surgical intervention would surely hesitate to treat a case for 28 years, or even 10 years, without interfering. But there is no doubt that there are some so averse to anything surgical, that they will rely solely on medical measures rather than/

than call in a brother physician in consultation, far less a surgeon! They will argue, if a patient can go for 28 years and yet, at the end of that time, a mass is suitable for excision, there is no need to hurry; or they may ask, when are we to know that malignant disease is coming on? Granted these are difficulties, it is the prevention that one aims at. But, on the other hand, in our endeavours to prevent, are we to open the abdomen of every girl, say, who has a gastric ulcer? No. That is the other extreme - it is a common-sense, reasonable, broad-minded view, that is required. Taken all over, I think surgeons tend to put too much weight on the "pre-cancerous" condition. Of my 200 carefully-taken histories, in 30 or 15 per cent only was a semi-suspicious, semi-certain story of severe gastric trouble, and in 17 of these 30, or 8.5 per cent of the 200 was a history - practically certain - of ulcer, elicited. As to pathological and microscopical findings, the proportion, 71 per cent (brought out by Wilson and McCarty) of old ulcers upon which carcinoma developed is truly great! It is not so in this country - we seem to have difficulty in saying definitely/

definitely - yes, the tissue here, though now carcinoma shows evidences of old ulcer. Not 1 in 10 pathologists I fear, would or could, conscientiously say so. Of my series, 5 pathological reports stated that the condition present might have originated in old ulcer.

Professor Alexis Thomson (15) has dealt with the question of fibromatosis associated with chronic ulcer and its simulation of carcinoma, and he gives results of the microscopic examination of portions of 24 stomachs which he had resected for cancer and stated that "in no less than 6 it was found that the lesion was a fibromatosis associated with chronic ulcer". Of 25 specimens resected for cancer by his colleagues on the Infirmary staff, "no less than 7 were found to be free from cancer". From the Anatomical Museum of the University, "although the material was not well preserved for microscopical examination", 6 out of 21 shewed no trace of cancer in those so catalogued - i.e. 19 out of 70 (the number he gives however is 72 which points to some slight numerical discrepancy, probably in the number of cases cited) or, as he says, 26.38 per cent were lesions/

lesions which simulated cancer. "In the stomach," he continues, "the lesion which most closely simulates cancer, and is most often mistaken for it, is a diffuse form of fibromatosis associated with ulcer; there are also rarer forms of fibromatosis - for example, those associated with tuberculosis and with syphilis."

In none of my 200 cases, though the question was probably asked in all of them, (and in the hospital patient, no concealment as a rule is made), was a history of syphilis elicited, and fibromatosis associated with this and tuberculous disease, must, I think, be rare. When one reads of 71 per cent of cases examined microscopically shewing definite changes of old ulcer etc., the remarks of Professor Thomson are very important - "it is to be borne in mind that pathologists are handicapped in the study of affections of the stomach by the bad state of preservation in which this organ comes under observation in the post-mortem room," - though the specimens examined by Wilson and McCarty were fresh operating-theatre specimens I take it.

The article, however, is most interesting and/

and shows the difficulties to be met with in deciding what to do on the "table". Taylor says - "in some cases the amount of fibroid change in the pylorus is so great that the lesion has been regarded as purely fibrous, and called hypertrophic stenosis. But the invasion of the lymphatics by cancer shows the nature of the thickening. However, the progress of these cases is slow, and the patients for years suffer only from the resulting dilatation."

In my series, I have carefully selected only those cases which to the finger and the naked eye declared themselves Carcinomatous. The finger of the skilled surgeon is worth many microscopes when it comes to operation - if a mass be stony hard - then no tuberculosis, syphilis or other fibromatosis is present, and if suspicious, the sooner removed the better. If an old ulcer, excise it. If glands, a wide excision should take place - just as in scirrhus mammae, provided that in all cases the condition of the patient warrants such steps. As for cases "where," as Professor Thomson says, "a pyloric tumour believed to be cancer has disappeared after gastro-enterostomy", there must surely be few. An interesting case -
the/

the only one of the kind I have seen referred to - it is that cited by Mr. Cathcart (16) - where the abdomen was closed, the case being pronounced inoperable. The patient, however, gained weight and the mass disappeared. No tissue was removed - a fact which he mentions to emphasize the importance of procuring microscopical evidence in all such cases.

There is something in malignant disease which speaks forcibly to the experienced touch, and there is in addition the look of the patient and the local appearances, and these, taken together, arouse suspicion. And, if operation be resorted to, the surgeon who has in his possession the suspicious gastric organ, in part or in whole, of a patient who is going about say, 1, 2, 3 or 4 years or more after operation, cares not whether what he has resected be actual carcinoma - the cause and course of cancer are admittedly doubtful, but the patient after such a lapse of time is probably safe.

Dreschfeld (17), writing of ulcer of the stomach in Allbutt's System says - "another complication of gastric ulcer is the supervention of cancer. This coincidence was already known to Dietrich/

1911) draws attention to the fact that, in his series of 1000 cases, whenever possible a chronic ulcer of Dietrich and Brinton, who drew especial attention to the subject; according to Lebert 9 per cent of all cases of cancer of the stomach owe their origin to simple ulcer of the stomach, but according to Rosenheim only 6 per cent; Haerberlin, again, reduces the number to 2-3 per cent. The observations of Hauser have thrown some light on the implantation of cancer on the ulcer; for he noticed masses of epithelial cells amidst the fibrous tissue at the borders of the ulcer; from which cells cancer may take its origin. The naked eye and histological appearances of the cancer thus formed do not differ from those of other cancers in the stomach; but the clinical features of such cancers, as a rule, are for a long time those of gastric ulcer, till eventually a tumour appears, and with it cancerous cachexia; yet even then the gastric juice still shows the presence of hydrochloric acid, and sometimes even of hyperacidity. In other cases the history of a case of cancer with the ordinary symptoms indicates that an ulcer had existed years before."

W.J. Mayo in the "Annals of Surgery" (Sept.

1911) draws attention to the fact that, in his series of 1000 cases, whenever possible a chronic ulcer of the stomach was excised because of the liability to cancerous degeneration. (18). Again Robert Hutchinson (19) says:-

"Some discussion has lately taken place as to the relation of carcinoma of the stomach to chronic gastric ulcer. Wilson and McCarty have made careful histological investigations of specimens of carcinoma, and found that of 153 undoubted cases, no fewer than 71 per cent 'presented sufficient gross and microscopic evidence of previous ulcer to warrant placing them in a group labelled carcinoma developing on preceding ulcer.' "

On the other hand, it has been pointed out by Gordon that this conclusion is opposed to clinical experience, which fails to show anything like such a high percentage of cases of carcinoma which give a history pointing to preceding gastric ulcer.

Hauser considers that the question is not yet ripe for settlement, and after reviewing some of the arguments on both sides, concludes that the development of carcinoma upon a basis of chronic or healed ulcer is probably far/

far commoner than has hitherto been supposed." With Gordon and Hauser I am forced to agree.

"The claim of those who advocate resection as the routine measure where feasible - Rydiger being one of the best known of them" - says Alexis Thomson (20) - "is that if the ulcer is allowed to remain the risk of its becoming cancerous is considerable." Taylor writing of ulcer says: - "an old ulcer may become actually the seat of a cancerous growth." Mansell Moullin (21) says: -....."nearly all cases of cancer of the stomach are preceded by definite evidence of gastric irritation, and more than half by the characteristic symptoms of chronic gastric ulcer." Hale White (22) says: - "there is no doubt that sometimes a simple ulcer of the stomach becomes cancerous; precisely how often this happens is very difficult to estimate. A simple ulcer becoming cancerous may occasionally be seen in the post-mortem room, but it is only reasonable to suppose that statistics from the death-house would underestimate the number of simple ulcers which became cancerous, for by the time of death the mass of growth is often so great that it is/

is impossible to say whether or not a simple ulcer preceded it." Moynihan (23) writes: - "Cancer of the stomach, in so far as it depends upon a chronic ulcer for its origin, is a preventable disorder.

It is probable that two-thirds of the whole number of the cases may be so classed." Mansell Moullin (24) in another paper talking of the expediency of surgical exploration in cases of unyielding gastric trouble says: - "if there is a chronic ulcer with such an amount of induration around it that it is impossible to distinguish it from carcinoma, it should be dealt with in the same way and either excision or gastro-jejunostomy should be performed according to the condition found. If not cancerous already there is every grave reason to fear that such an ulcer, continually being irritated, will become cancerous."

Of my cases 15 per cent at most might have had chronic ulcer. Certainly 8.5 per cent had chronic or healed ulcer (if their stories be true) and several more might have had old ulceration. But still there is a large number of patients, and probably the bulk of them - say 60-70 per cent at the least, who never/

never ailed before; who, like Napoleon, had stomachs of iron until their last illness - i.e. a duration of 6-18 months or 2 years - began, and often less than that. Can they possibly have had an ulcer and never known it? This is rather difficult to believe. Mansell Moullin (21) in his 1910 paper, says: -

"Cancer may conceivably originate in an organ that is healthy so far as we can tell; but it is infinitely more likely to originate in one that has been injured, and in the part that has been injured; and the more frequent the injury the more likely it is to follow. In every other organ of the body chronic ulceration is one of the strongest predisposing causes of cancer that we know. It would be the most extraordinary exception if it were not so here." He points out that, at first "merely a pious expression of opinion," it became such a pronounced factor that in a few years it was put down as 4 per cent and rose to 14, 26, 54, and 72, "while Seapeshko, as quoted by Jedlicka, maintains that upwards of 90 out of every 100 cases of carcinoma of the stomach are preceded by something in the nature of an ulcer." Again he says - "Every case of/

of chronic ulcer of the stomach is a potential case of carcinoma." Certainly it is a remarkable coincidence that the favourite sites for gastric ulcer and gastric cancer are included in that small area towards the pyloric orifice. As to what Hale White says with regard to the possibility of pyloric carcinoma being caused by irritation, and there is no doubt that irritation and cancer are cause and effect in many other regions, e.g. the lip, tongue, gall-bladder, great intestine generally, anus, bladder, penis, breast and uterus, and if we admit that say 65 per cent of gastric carcinomata are primarily pyloric and say 10 per cent probably primarily cardiac, does there not appear to be a possibility that irritation has a good deal to do with the occurrence of malignant disease at both orifices? Add to this the fact that the teeth of those above 40 years of age, and even of those over 20 in the lower classes, are often very cavius, useless, abounding with septic material and frequently absent, the food being thus unmasticated and tainted.

Can it be that the superior state of the teeth in black races accounts in some measure for the/

the rarer occurrence of the disease in negroes?

Sherren, whom I have quoted before, writing on the prevention of carcinoma of the stomach says: -

"there is little doubt that acute gastric and duodenal ulceration is a septic disease. Oral sepsis is, I believe, a fertile cause of gastric ulcer, and hence one of the predisposing causes of cancer of the stomach. It is no uncommon thing for me to have to delay operation on patients with undoubted organic gastric disease of long standing until carious stumps have been removed. It is not known with certainty why many acute ulcers heal and others do not; it may be that oral sepsis has something to do with it." "Attention to the hygiene of the mouth," he concludes, "thorough treatment of acute and early chronic gastric ulcer, handing over to the surgeon those in the latter group that fail to respond to or relapse after treatment, would, I am sure, greatly diminish the incidence of carcinoma of the stomach." With all of which I wholly concur.

MORBID/

According to Beattie and Dickson :-

"the most frequent sites of gastric carcinoma are the pyloric end of the stomach and the lesser curvature though it may develop at the cardiac orifice or at some point in the body of the organ. About sixty per cent of tumours are found at the pylorus or in its vicinity, twenty per cent at or near the lesser curvature, ten per cent at the cardiac orifice and ten per cent at other parts of the stomach wall. The tumours are usually adenomatous in type, and frequently show colloid or myxomatous degeneration. Those at or near the pylorus grow rather slowly, and during their growth, a considerable amount of fibrous tissue is formed, with only a moderate degree of cellular proliferation, giving a tumour of the scirrhus type. Those in the body of the organ and in the lesser curvature grow more rapidly, and may form irregular, fungating, cauliflower-like excrescences, projecting into the cavity. These tumours are very cellular, and exhibit the type of malignant adenoma or sometimes encephaloid cancer."

Welch, /

Welch, says Osler, analysed 1300 cases and gave as the distribution of the tumour site:-

"Pyloric region, 791; lesser curvature, 148; cardia 104; posterior wall, 68; the whole or greater part of the stomach, 61; multiple tumors, 45; greater curvature, 34; anterior wall, 30; fundus, 19."

Taylor states that:-

"In the majority of cases the pylorus is involved, and the disease extends thence to the adjacent parts of the organs; especially along the lesser curvature. If it affects the cardiac end, the oesophagus is generally also invaded."

"As the pylorus," says Hale White, "is the narrowest part of the stomach, it is the part most likely to be irritated by the passage of indigestible masses of food; and this may explain the greater prevalence of cancer at the pylorus."

Brinton found the growth at the pylorus in 219 out of 360 cases; and Habershon gives the following table, shewing the position of the growth in 79 cases which he examined at Guy's Hospital:-

Pylorus in 41.	Middle in 4.
Lesser Curvature in 11.	Multiple in 1.
Cardia in 10.	Greater Curvature in 1.
Anterior Wall in 5	Cardia & Pylorus in 1.
General in 5.	

These/

These figures agree very closely with those given by Osler and those given by Welch after a study of 1300 cases. Perry and Shaw found the pylorus affected in 70% of the cases."

In Boardman Reed's book, there is a list of cases given according to Lebert, the position being as follows:- Pylorus, 51%; lesser curvature, 16%; Cardia, 9%; anterior wall, 3%; posterior wall, 4%; Anterior and Posterior walls, 4%; greater curvature, 4%; diffuse infiltration, 6%; and it is added that 72% are of the scirrhus type.

Savill states that; —

"In two-thirds (two-fifths Hemmeter) of the cases of cancer of the stomach there is no tumour, but a scirrhus infiltration of the pylorus which produces obstruction of that orifice and leads to Dilatation."

In my series of 200 cases, the "Gastric" cases, in which, as stated at the outset, are included cases of cardiac and lower oesophagial disease and fundal and body of the stomach cases, number 49 or 24.5%. The "Pyloric" cases — the term embracing pylorus cases and those of disease of the pyloric antrum (on both curvatures and on both walls) number 151, or 75.5%. The figures are/

are only approximate, it is true, but they will be seen to agree fairly closely with those of other investigators. It is, of course, difficult to make accurate investigations on the operation table, and to discover beyond question on what wall or what curvature disease is placed, but such are the results obtained so far as circumstances permit:

Hale White writes:-

"Perry and Shaw believe that all universal fibrous indurations of the stomach not due to swallowing corrosives are caused by hard and slowly growing carcinoma. And, further, a considerable number at any rate of cases of so-called non-malignant scirrhus of the pylorus (fibrous pylorus) not due to corrosive poisoning or the contraction of an ulcer are really cancerous. Certainly I am disposed to agree strongly with both these propositions. The only exception I know is that in the chronic inflammatory thickening which occurs around the gall-bladder in some cases of gall-stones the pylorus may be very thick and fibrous."

With these statements one strongly agrees. There can be little doubt, I venture to think, that many cases which have been operated upon and where a diagnosis of simple fibrous pylorus has/

has been made and gastro-enterostomy performed, have succumbed later to malignant disease, rather than that the tumour has disappeared. And it is more than probable that had they been eradicated at once brilliant results would have been obtained. In all cases, however, the surgeon is to decide carefully after digital examination of the stomach and surrounding glands; and an experienced surgeon rarely errs.

Having already classified my cases as "Gastric" and "Pyloric" (on page 3) I now proceed to give details of the situation of the growth:-

Of the 49 so-called "Gastric" cases, there were 6 wholly cardiac cases; 1 cardiac and anterior wall; 2 cardiac cases with involvement of the œsophagus; 2 cardiac with lesser curvature involvement; and 1 cardiac with involvement of part of the body of the stomach; in all	12.
Anterior wall, one of them involving also the posterior wall, and one involving also the lesser curvature.	5.
Posterior wall, one of them involving the greater curvature	2.
Greater curvature	2.
Lesser curvature	3.
General carcinoma of the body of the stomach	25.

Of the 151 "Pyloric" cases there were:-

(a) implicating the pylorus in large measure with involvement/

involvement of the antrum pylori in many cases 99.

(b) affecting the pyloric portion of the stomach mainly on the lesser curvature, and mostly on the posterior wall 38.

(c) affecting the pyloric portion mainly on the greater curvature 4.

In the remaining 10 cases which were all pyloric and extensive, either no operation was performed, or the abdomen merely opened tension from ascitic fluid relieved, or adhesions divided.

With regard to the type of disease, definite pathological information, owing to various causes is, in the majority of cases, lacking -: In a number of cases (especially the earlier of the series), no examination, though perhaps possible, of the tissue took place. In some cases, the appearances on exploration were so obviously malignant and hopeless that no removal was attempted. In the case of some who died in hospital, no post-mortem examination followed. Others, being able to return home, though only to die shortly after, were in consequence lost sight of.

In those cases (40) where reports were obtained either through operation or post-mortem, the results were as follows-:

1. Columnar-celled Carcinoma or Adeno-Carcinoma - 23 cases, 6 of these undergoing colloid/

colloid degeneration; 2 showing evidence of old peptic ulcer; one in combination with scirrhus cancer.

2. Spheroidal-celled ~~or~~ scirrhus Carcinoma - 10 cases. All pyloric - one showing colloid degeneration.

3. Encephaloid or medullary Carcinoma, 1 case.

4. Colloid Carcinoma. 1 case.

It is interesting to note that from these figures, one would draw an opposite conclusion from that drawn by Hale White who in dealing with colloid degeneration would seem to argue that this degeneration is "much more common in spheroidal than in cylindrical-celled carcinoma", basing his conclusions on 1 out of 12 cases of the latter and 9 out of 32 of the former.

(a) SECONDARY CANCER OF THE STOMACH.

This is a very rare condition. Osler writes that "of 37 cases collected by Welch, 17 were secondary to cancer of the breast. Among the first 1,000 autopsies at the Johns Hopkins Hospital there were 3 cases of secondary cancer."

Hale White states that secondary growths in the stomach are rare.

Judging/

Judging by our experience at Guy's" he says, "and by other recorded cases, probably about 6 or 7 per cent of malignant growths in the stomach are secondary. The primary growth may be anywhere; the breast is the most common seat." He also states that the remainder of Welch's 37 collected cases of secondary carcinoma were as follows:- "3 to cancer of the oesophagus, 3 to cancer of the mouth and nose, and the remainder to other parts." He continues, "I have known an epithelioma of the stomach to be secondary to epithelioma of the oesophagus The symptoms do not differ from those of primary disease of the organ; but often those of the primary growth overshadow them, and the patient dies before the gastric symptoms are very manifest."

In my series, there are only two cases in which any suspicion of the disease being of a secondary nature was present, namely, those already noted under Previous diseases (page 24). These were both females in the case of whom the right breast had been excised in one 12 years before and in the other 1 year before. In the first it was definitely stated for "scirrhus", and in the second, for "tumour".
The/

The first patient was aged 55 (i.e. 43 when the breast was removed), and upon her also hysterectomy for "tumour" was performed 7 years before - i.e. when 48 - rather a suspicious history. There was an inoperable carcinoma of the lesser curvature, and she died a week after operation.

The other patient was aged 37 (or 36 when the breast was operated upon). In her case, a large "gastric" and "pyloric" tumour was removed, and one year later she returned with a pelvic recurrence.

I have since seen and diagnosed a case, also in a female, aged 46, in whom the right breast had been resected 11 years before for scirrhus. She presented only "suspicious" gastric symptoms e.g. aversion to meat, flatulence and slight loss of weight, of 4 months' duration. Yet on her abdomen being opened, a carcinoma, absolutely inoperable was found, involving the lesser curvature of the stomach which was adherent to the under surface of the liver.

With regard to the question of cases in the region of the cardiac orifice being secondary to oesophageal disease, one is not prepared to give an opinion, as many of these are borderland cases and/



and microscopical evidence being lacking, no definite grounds for opinion exist. It strikes one, however, that the statement "probably about 6 or 7% of malignant growths in the stomach are secondary" is a somewhat exaggerated one. In my humble opinion, the point about gastric malignant disease is that it is alas, too insidiously primary in all cases, if we except those arising at the lower end of the oesophagus.

There were two cases of squamous-celled carcinoma of the cardiac orifice with, in one, the cardia generally affected, and, in the other, the lesser curvature; but in both, secondary nodules of squamous-celled carcinoma (microscopical examination) in the edge of the liver were present.

(b) CHANGES IN THE STOMACH.

As Osler states,--

"Cancer at the cardia is usually associated with wasting of the organ and reduction in its size. The oesophagus above the obstruction may be greatly dilated. On the other hand, annular cancer at the pylorus causes stenosis with great dilatation of the organ.

In/

In a few rare instances the pylorus has been extremely narrow without any increase in the size of the stomach. In diffuse scirrhus cancer the stomach may be very greatly thickened and contracted. It may be displaced or altered in shape by the weight of the tumor, particularly in cancer of the pylorus; in such cases it has been found in every region of the abdomen, and even in the true pelvis. The immobility of the tumors, is at times extraordinary and very deceptive, and they may be pushed into the right hypochondrium or into the splenic region, entirely beneath the ribs. Adhesions very frequently occur, particularly to the colon, the liver, and the anterior abdominal wall."

Taylor says much the same thing and in talking of adhesions states that "adhesion of the stomach to other organs commonly takes place, as the growth reaches the peritoneal surface, and invasion of the organ with cancer may follow. The liver and pancreas are thus frequently attacked; occasionally the spleen or colon. In the last case a gastro-colic fistula may result. When/

action.

frequently/

When the cancer is in front, the abdominal wall may become adherent, or, in the absence of adhesion, perforation into the peritoneum may take place; but this is much less likely than in simple ulcer. More often subacute or chronic peritonitis takes place without perforation, either spreading from the original lesion, or following a general growth of cancer in the peritoneum. Cancer of the cardiac extremity frequently invades and obstructs the oesophagus."

Beattie and Dickson say "Cancer at the pyloric orifice causes a ring-like infiltration of the mucous and submucous tissues, and thus produces stenosis of the orifice which leads to dilatation and hypertrophy of the organ, with stagnation of food and consequent fermentation changes. Ulceration of the inner surface of the tumour, and hæmorrhage are usually later manifestations. A tumour at the cardiac orifice is, as a rule, small, unless it is associated with and a continuation of a squamous epithelioma of the oesophagus. But, in this situation the tumour is more liable to damage; and, therefore, ulceration is a common feature of the condition. Cancer of the body of the stomach frequently/

frequently becomes ulcerated, and hæmorrhage is a common sign of the disease."

In pyloric carcinomata, according to Fagge, the stomach may be so large as to hold 6 or 7 pints. It may fill the whole abdomen, the greater curvature sweeping round in the pubic region.

With regard to my series, there were 24 cases in which the stomach was markedly adherent to the under surface of the liver above, and to the pancreas behind, and retracted up under the ribs, the disease at the pylorus being made out only with difficulty at the operation. In 6 cases, there was marked dilatation of the stomach from pyloric disease, and in one of these, the pylorus lay below the level of the umbilicus and the body of the organ lay in the left iliac fossa. This is a very small number of cases of marked dilatation. There were several cases in which the stomach was normal in size. In 16 cases, the pylorus was freely movable, and the tumour was most elusive. In 7 cases, loops of small intestine were adherent to the growth. In 11 cases, the great gut was adherent (either transverse colon or splenic flexure), but in no case was there a definite fistulous communication/

communication, though I have seen one case (apart from this series) in a woman aged 55 who quite suddenly brought up faecal material by the mouth, when the diagnosis which had been in doubt, was only too clear. In several cases, there was evidence of involvement of the bowel wall in the growth, the meso-colon and mesenteries being puckered and much shortened in addition. It is remarkable how seldom intestinal obstruction is caused in this manner. In 2 cases, the tumour was adherent to the anterior abdominal wall which was involved, and in these, of course, a very palpable and immobile mass was present. With regard to "india-rubber bottle stomach" about which so much has been written, there was no instance of this that I could find in the 200 cases with which I am dealing.

When the tumour is placed below the level of the umbilicus, great difficulty in diagnosis is often experienced, especially if the gastric symptoms be only moderate in severity. A case in point is that of a woman aged 61 who was shewn to the Medico-Chirurgical Society of Edinburgh by Mr Cotterill (26) in December 1903. She had "had vague symptoms of stomach disorder for some years. A tumour could be/

* 3 typical cases, mobile long ovoid tumour
 attached to left of mid line

be felt in the left iliac fossa. This proved to be an adeno-carcinoma of the anterior wall of the stomach, this viscus being very markedly displaced."

Hertz (27) in an address on Dilated Stomach, states that "Pyloric obstruction is due in the vast majority of cases to the results of gastric or duodenal ulceration or to cancer. . . . Cancer of the stomach does not commonly arise at the pylorus itself, but in the majority of cases it spreads from the lesser curvature so as finally to involve the pylorus."

(c)/

(c) SECONDARY GROWTHS.

These, according to Osler, "are very frequent, as shown by the following analysis by Welch of 1,574 cases. Metastasis occurred in the lymphatic glands in 551; in the liver in 475; in the peritoneum, omentum and intestine in 357; in the pancreas in 122; in the pleura and lung in 98; in the spleen in 26; in the brain and meninges in 9; in other parts in 92. The lymph-glands affected are usually those of the abdomen, but the cervical and inguinal glands are not infrequently attacked, and give an important clue in diagnosis. Secondary metastatic growths occur subcutaneously, either at the navel or beneath the skin in the vicinity, and are of great value in diagnosis. In one instance a patient with jaundice, which had developed somewhat suddenly, and was believed to be catarrhal, presented no signs of enlargement of the liver or tumor of the stomach, but a nodular body appeared at the navel, which on removal proved to be a typical scirrhus. A second case in the ward at the same time, with an obscure, doubtful/

doubtful tumor in the left hypochondrium, developed a painful nodular subcutaneous growth midway between the navel and the left margin of the ribs."

Taylor states that "secondary deposits occur in various organs, in the peritoneum, in the liver, pancreas, and especially in the mesenteric, retroperitoneal and portal lymph-glands. The spleen is more rarely affected; and occasionally more distant organs, as the brain and lungs. After death from cancer, the heart is commonly in the condition known as brown atrophy."

Hale White states that "the growth may adhere to and invade the liver, the pancreas, the spine, the intestine, or the abdominal wall; but adhesions to the liver, intestine and pancreas are much the commonest, and these organs are often extensively invaded. To complete the picture, we must imagine that in most cases there are secondary growths, that fistulous communications sometimes form, and that, when the growth is at the pylorus, the stomach is generally much hypertrophied and dilated." Again he states that it is by no means rare to meet with instances in which the/

the disease has never been suspected till secondary growths are perceptible, usually in the liver. He writes further:-

"Secondary growths in other organs are very common. On an analysis of 38 cases of malignant disease of the stomach, all examined histologically, collected by Perry and Shaw, no secondary deposits were found after death in 7 cases (18 per cent), a percentage obtained by other writers. They occurred in one organ in 15 cases; in two organs in 8 cases; in three organs in 6 cases; in four organs in 1 case; and in eight organs in 1 case. All authors agree that the lymphatic glands are most frequently affected, being infiltrated in a little over a third of all cases; the liver is affected in about a third, the peritoneum in about a fifth, the lungs in about an eighth, and the pleura in about a tenth; but growths may be found anywhere in the body. These secondary deposits frequently cause important symptoms; thus, the affection of the liver or of the glands in the portal fissure often leads to fatal jaundice, or the implication of the peritoneum, helped by pressure of some mass on the portal/

portal vein, leads to ascites. Secondary growths often cause death from bronchitis and pneumonia, and when the pleura is affected there may be pleural effusion. The left supraclavicular glands should always be examined, for they are sometimes enlarged by secondary infiltration, and this may be so in cases in which it would be otherwise impossible to come to a correct diagnosis. The enlargement has been found after death to be due to direct spread up the thoracic duct, but it has been suggested that sometimes infection takes place by other lymphatic channels through the diaphragm. Occasionally the left axillary glands are affected. The navel, too, may be implicated by palpable secondary growths; usually, but not always, the peritoneum then has secondary nodules in it."

Beattie and Dickson write:- "Infection of the mediastinal glands may occur, and it is not uncommon to find enlarged cancerous glands at the root of the neck in such cases."

Boardman Reed states:- "Metastases involve the lymphatic glands and other organs, especially the liver. The metastatic growths are identical with the primary."

With/

With regard to my cases, secondary growths occurred in the:-

(a)	lymphatic glands	in 104 cases.
(b)	liver	in 26 cases.
(c)	peritoneum	in 4 cases.
(d)	omentum	in 15 cases.
(e)	gall-bladder	in 6 cases.
(f)	spleen	in 4 cases.
(g)	pancreas	in 24 cases.
(h)	common bile-duct	in 2 cases.
(i)	duodenum	in 5 cases.
(j))	jejunum	in 3 cases
(k)	diaphragm	in 3 cases.
(l)	vertebrae	in 3 cases.
(m)	pelvis	in 3 cases.
(n)	colon	in 11 cases.

Further on special reference is made to a case in which multiple metastases occurred. With reference to the heading (b), i.e., the liver:- Only 26 cases were found, these being definite secondary deposits; in some of the 24 cases, also previously referred to, (page 55), where the main "gastric"/

"gastric" or "pyloric" mass was adherent to its lower surface, the organ would be invaded; in three of the cases, the secondary mass in the liver was the tumour palpable in the epigastric region, the gastric tumour lying under the organ, and in one of them there was also a small mass below and to the right, which was the primary gastric tumour; and in one case the gastric tumour was relatively small, while the liver was riddled with secondary umbilicated masses, and reached down to the level of the umbilicus in the middle line.

With reference to heading (c), i.e., the peritoneum:- In the 4 cases, the general cavity was studded over with masses of varying size, and in these, as in 10 other cases, a varying quantity of ascitic fluid was present.

With reference to heading (d), i.e., the omentum:- There were 15 cases. In 5 of these the mass was exclusively in the gastro-hepatic omentum; in the others, both large and small omenta were involved.

With reference to heading (f), i.e., the spleen:- There were 4 instances - all being associated/

associated with "gastric" tumours.

With reference to heading (g), i.e., the pancreas:- There were 24 cases; in all the urine was normal - no glycosuria.

In many of the cases in which the liver, or gall-bladder, or bile-duct was involved, there was an associated jaundice.

As regards heading (i), i.e., the duodenum:- It will be seen that in 5 cases it was invaded. This occurred for a varying distance. The cases were naturally all "pyloric", and three of them were males, 2 females. This gives a percentage of 2.5. The subject of duodenal invasion is interesting. Rolleston, (28), writing of primary carcinoma of the duodenum, says:-

"It is generally held that carcinoma of the pylorus does not extend into the duodenum, and certainly the cases are very few in which it spreads widely into it; but it must be borne in mind that when carcinoma attacks the pyloric region, the situation of the pyloric valve may be difficult to define accurately, and the tumour and the pylorus may be regarded as co-extensive.

In/

In 10 specimens in which the pylorus had been excised for carcinoma, Cuneo and Lecene found that the growth had extended into the duodenum, as judged by the naked eye, in one instance only, but that microscopically the lymphatics in the duodenum were infected in three others for a short distance, never more than $\frac{4}{5}$ ths of an inch." He says further "In about 10 cases (Perry and Shaw, 5, Nattan-Larrier, 5), carcinoma has arisen in the site of a pre-existing ulcer, but ulcer cannot be an important factor in the causation of duodenal carcinoma, because ulcer is almost confined to the first part, while carcinoma is much more frequent in the second." It is, he points out, much more common in males.

Alexis Thomson, in the paper before referred to, says:- "I was formerly inclined to regard involvement of the duodenum as supporting the non-malignancy of the gastric lesion, but a case under my own observation showed that this reasoning is not to be trusted."

Mayo Robson, in his excellent book before quoted from, writes:- "Cuneo observed that pyloric growth frequently spares the duodenum, thence when a tumour extends well into it from the pylorus/

pylorus, the chances are that it may be inflammatory swelling around an ulcer." He points out that this fact has enabled him to decide whether gastro-enterostomy or partial gastrectomy should be resorted to, but he adds, "the rule, is, however, not absolute, as I have seen both cancer and sarcoma extend through the pylorus into the duodenum."

From Lochhead's review of Mayo's "1,000 cases, in which at operation an indurated ulcer of the stomach or duodenum was actively demonstrated, one notes that "two-thirds of the cases operated on during the last five years had their origin in the duodenum, and one-third in the stomach Three-fourths of the operations were performed in males," and it would appear that most frequent situation of the ulcers, whether gastric or duodenal, is within two inches of the pylorus.

This comparative duodenal immunity seems to me rather remarkable. One would expect that duodenal invasion or duodenal carcinoma would more frequently occur, from the number of ulcers which occur in this neighbourhood (if irritation is a causative factor in the production of carcinomata), seeing/

seeing that in addition, I think it will be granted, duodenal ulcers are most obstinate and resistant to treatment.

One case of great interest is that of a girl of 22 (Gastric No.40), who, beyond being operated on for appendicitis when aet. 19, had always been well till a year before admission to hospital. She had had pain in the back with occasional vomiting after her food. She was treated for hysteria, dyspepsia (neurotic), and constipation. She had been losing weight, and was sent for a 'holiday'. She had also been treated for phthisis. She lost weight steadily for nine months, and "went off her food." For 14 days before admission (she had also been seen by a gynecologist for 'uterine trouble'), she had had a gnawing pain in the left side of the abdomen, which passed to the back, and also pain in the left shoulder joint. Vomiting was constant. There was very marked constipation. The temperature was normal. Her weight was 6 st. 6 $\frac{1}{4}$ lbs. - she had once been 9 stone. She was a thin, pale, delicate-looking girl, with sunken eyes. There was a short cough. There were enlarged glands in the left groin and in the left supraclavicular region. The lungs were healthy, though the chest walls were emaciated. The abdominal wall was/

was bereft of subcutaneous fat. On palpation, there was resistance, with tenderness and uneasiness in the left hypochondriac, left lumbar and epigastric regions, also dulness on percussion. A large tumour was with difficulty palpated, which moved with respiration, and below and to the left side there was a defined edge. Beyond a small diminution in the red cells and a more marked change (loss) in the haemoglobin, there were no blood changes. There was some pus in the urine. No tubercle bacilli were found. The mass was diagnosed by me as a gastric neoplasm, and on operating this was found to be, alas, too true. The stomach was a semi-solid mass of new growth, with glands in the omenta, meso-colon, and at the root of the oesophagus. A gland removed showed it to be columnar-celled carcinoma. The abdomen was closed and 45 days later she died. During this time she was kept practically continuously under the influence of opium. The pain in the left shoulder-joint continued, and although, on examination on admission, nothing disturbed the usual regular contour of the osseous formation here, yet within two or three days a mass was felt which steadily increased in size. During her stay in the ward, /

ward, further masses developed on the ribs of the left side of the chest, over the left scapula (spine and acromion), and in the cranial bones (right parietal and frontal). Post-mortem examination revealed further secondary growths of the supra-renal bodies of each side, of the diaphragm and left pleura ovaries, and capsules of the liver and spleen. Also it may be stated that a left pleural effusion which developed was haemorrhagic on exploration, and though the lungs were healthy, the pleura was affected, which explained this circumstance. Her weight before death was 5 st. $11\frac{1}{2}$ lbs.

SYMPTOMS.

(a) LATENT CARCINOMA. Osler writes:-

"The cases are not very infrequent. There may be no symptoms pointing to the stomach, and the tumour may be discovered accidentally after death. In a second group the symptoms of carcinoma are present, not of the stomach, but of the liver or some other organ, or there are subcutaneous nodules, or as in one of our cases, secondary masses on the ribs and vertebrae. In a third group, seen/

seen particularly in elderly persons in institutions, there is gradual asthenia, without nausea, vomiting or other local symptoms."

(b) FEATURES OF ONSET.

"Of the 150 cases in our series, 48 complained of pain, 44 of dyspepsia, 21 of vomiting, 3 of loss in weight, 3 of difficulty in swallowing, 1 of tumour. In 7 the features of onset suggested pernicious anaemia. In 37 cases there was a history of sudden onset."

Hale White says, with respect to latent cases:- "In any large series from the post-mortem room, there will be a small number of cases in which cancer of the stomach is found after death, although unsuspected during life. Eight out of Osler and McCrae's 150 cases were latent. As Perry and Shaw point out, the latent cancers of the stomach may be divided into two groups, (1) those who die from cancer of the stomach without its being suspected during life, and (2) those who die with cancer of the stomach without its being suspected during life. With regard to this group Welch remarks that it is rare to find cancer of the stomach in an apparently healthy man/

man dying of an accident; this is true, for out of 21,260 post-mortem examinations, Sir C. Perry and Dr. Shaw only found 7 such cases. All the patients died of some malady other than cancer of the stomach, and there were no symptoms pointing to cancer of the stomach. The case of a woman from whose history nothing could be learnt suggesting cancer of the stomach, although when she died from a strangulated hernia a gastric carcinoma, extending from the pylorus along almost the whole of both walls for five inches, is of great interest. Among the 306 cases of cancer of the stomach occurring in the 21,260 autopsies, they found 13 examples of the first group of latent cases. Mistakes with regard to these cases can only be avoided by great care."

With regard to my series of cases, there does not appear to have been an instance in which gastric symptoms were not present, and where the disease was not suspected, even though there were several in which jaundice, ascites and palpable masses in the right hypochondriac region pointed to hepatic involvement. These cases, it need hardly be said, were very carefully investigated before operation, /

operation, many being first of all on the medical side of the hospital, and there subjected to all clinical tests. This is the common condition of the cases of carcinoma of the stomach on reaching the surgeon at the present day - the disease is so well manifested that the very fact that it is diagnosed so readily points to the all too hopeless result. I have not heard of a case in my short experience of the post-mortem room of the Edinburgh Royal Infirmary, where gastric carcinoma was found accidentally - no doubt it happens from time to time, but it cannot be common.

I have tabulated, under the headings of Pain, Dyspepsia, Vomiting, Loss of weight, Difficulty in Swallowing and of Tumour, the number of cases in which these constituted (1) features of onset, and (2) the main complaint.

	Pain,		Dyspepsia.		Vomiting.		Loss of Weight.		Dysphagia.		Tumour.	
	Oc.	M.	Oc.	M.	Oc.	M.	Oc.	M.	Oc.	M.	Oc.	M.
	in	in	in	in	in	in	in	in	in	in	in	in
"Gastric" (49)	35	31	3	3	20	2	15	2	10	10	1	1
"Pyloric" (151)	99	89	31	31	77	21	36	3	-	-	10	7
	134	120	34	34	97	23	51	5	10	10	11	3

It/

It will thus be seen that pain is unquestionably the chief complaint, the next in order as regards frequency being dyspepsia which includes waterbrash, flatulence, heartburn, and the vast number of cases in which there is a "fulness after food in the epigastrium". These together equal 77% of the cases.

In 14 cases ("gastric" 2; "pyloric" 12.) the onset of the disease was sudden, the patients having previously been in good health. Below I append an analysis of these:-

	Haematemesis	Acute Pain.
"Gastric"	1.	1.
	Haematemesis and acute pain	Haematemesis and faintness
	2.	2.
"Pyloric"	Diarrhoea	Haematemesis faintness and melaena.
	1.	1.
	2.	
	Melaena	
	4.	

In 5 cases, the disease was said to have begun with an attack of Influenza. But as in one or two of these cases, a tumour was first palpated on the doctor being called for the latter trouble, it is conceivable that the primary gastric disease had, by lowering the resistance of the patients, unknown/

unknown to them, rendered them easy victims to the more acute malady.

Pain was complained of in 35 out of 49 "gastric" cases, and in 99 out of 151 "pyloric" cases.

As regards Dyspepsia, which, taken generally, includes uneasiness after food referred to the epigastrium; feeling of load, weight or distension at varying intervals after food, waterbrash, flatulence and heartburn, - only 3 "gastric" cases out of 49 had this, a small number, whereas in 31 "pyloric" cases out of 151 it was the main symptom - figures quite consistent with what one associates with pyloric involvement.

With reference to Vomiting, it was present in 20 "gastric" cases and in 77 "pyloric" cases. The "gastric" cases include those of obstruction of the lower end of the oesophagus - the immediate rejection of food being considered as "vomiting". Taken generally, therefore, more than half of the cases of "pyloric" disease - 77 out of 151 - have vomiting as an important symptom.

Of 49 "gastric" cases, 15, and of 151 "pyloric" cases, 36, complained of Loss of weight. It is true, that in practically all the cases, the patients (on being questioned) admitted having lost weight markedly, and it was only too manifest on examining/

examining them but more important things to them, as for instance pain, were as a rule, given first and foremost place in their statement as to complaint.

Of 49 "gastric" cases, 10 complained of Difficulty in swallowing. These were all cases of either lower oesophageal or very proximal "cardiac" disease. No "pyloric case" complained of dysphagia.

Of 49 "gastric" cases, 1 complained of Tumour. This is quite in agreement with the usual findings, namely, that disease of the lower end of the oesophagus, or of the cardia and fundus of the stomach - regions which are almost wholly under cover of the ribs and costal cartilages is difficult to palpate and, as a rule, does not give rise to a palpable tumour until the final stages. 10 "pyloric" cases complained of "tumour". Seven gave it the first place among their symptoms, the patients, in some instances, having discovered the tumour themselves.

If then we exclude dyspepsia which I have treated in a comprehensive manner, embracing as it does symptoms even important in themselves, the three outstanding complaints would appear to be - Pain - the compelling factor, being given first; secondly/

secondly Vomiting; and finally Loss of weight, the usual history in short of a gastric carcinoma case. In the vast majority, along with pain are given also a feeling of load and weight after food (included with others under dyspepsia).

In very few really were such statements given as that they were averse to any particular article of food. Many, however, said that, in addition to losing weight, they had lost appetite and strength, and experienced a great feeling of lassitude, expressed often thus "I felt weak, lost flesh and became pale" or "I always felt done out at nights."

With regard to (c) GENERAL SYMPTOMS, Osler, dealing with (1) Loss of Weight, says that "progressive emaciation is one of the most constant features of the disease" and adds, later, that "loss in strength is usually proportionate to the loss in weight."

How true are the words; and yet how few medical men seem to remember the fact. It is, to my mind, a very grave omission to fail to weigh systematically, week by week (if not oftener), and under the same conditions as to dress, period of the day, etc., - every patient who shows gastric symptoms. The student who worked faithfully in/

in the wards of a hospital must have seen the weighing of these patients performed, or the results charted; and yet, no sooner is he in practice, than all his teaching is ignored and thrown to the winds. In a disease so difficult to diagnose in its early stages, surely this one constant sign might be sought for. We do not need any elaborate tests, tests which involve many chemical processes and which too often are of practical value in the later stages only, tests, too, which the average patient cannot pay for and with which the ordinary practitioner will in few cases acquaint himself. But a weekly ascertaining of the weight does help; it needs no time, involves no expense, and if the practitioner be so busy that he cannot afford the time to ascertain it for himself, he can at least see that the patient takes his weight and reports. It is simple. And yet it is seldom resorted to. One reads that an examination of the lymphatic glands is useful in diagnosis and may furnish a useful clue. Lymphatic glands! A useful clue! A clue perhaps - in prognosis, only to the inevitable issue. It is too late. We have reached the penultimate state. And yet, long before the gland/

gland was affected, the weight was steadily going down and was never noted - though the facies itself would have showed it.

In no other disease is weight so important or its decrease so constant. No matter how treated, there is the steady fall. Perhaps an occasional slight rise may occur but not for long - a week or two at the most and then down, down, down! Osler gives a series of cases in which exact figures were taken - the most common fall being one of from 3 - 4 stones. One case of 7 stone loss occurred - an example of the class of cardiac and oesophageal obstruction where the patient becomes dehydrated, cyanosed and dies from starvation, with subnormal temperature, unless relieved by Gastrostomy or some other similar operation. I had such a case under my care which illustrated this. Almost immediately after gastrostomy, the cyanosis disappeared and the temperature gradually rose as nutrition improved.

Osler states that the "loss in weight is not always progressive" and gives 3 instances where we see increase, viz. (a) proper dieting, with treatment of the associated catarrh of the stomach; (b) in cases of cancer of the pylorus after relief of/

of the dilatation of the organ by lavage, etc., (c) after a profound mental impression, and continuing he says, "I have known a gain of ten pounds to follow the visit of an optimistic consultant. In Keen and D.D.Stewart's case there was a gain of seventy pounds after an exploratory operation!"

I will discuss these points here:-

1. There is no doubt that a slight evanescent rise in weight will often occur with "proper dieting, with treatment of the associated catarrh of the stomach." But here lies the fallacy. Is the rise sustained for weeks? If not so sustained, and if not also marked, urgent steps should be taken. Physicians always say when asked that they had the possibility of carcinoma in view, yet, they treat such cases, get an improvement perhaps, and at the end of a week or two leave off attending or perhaps send the patient out, feeling better, but probably not weighing much more. And the result? The patient promptly relapses and if the doctor be not communicated with or the patient fail to return to report, in 5 times out of 10 let us say (and that is not exaggerating) he comes back as bad as ever - often worse and sometimes with a tumour. This, if not definitely palpable before, or if suspicions regarding/

regarding it were not strongly aroused, is now definitely palpable, aye even visible, and the patient probably beyond the reach of surgical aid. His chance of cure has gone. With this before us is it not unreasonable to talk of "proper dieting?" The easygoing may be satisfied but the mischief is still there and active. First exclude carcinoma from the diagnosis, then treat, then diet. In the words of Taylor "Ulcer is nearly always improved by proper dietetic treatment, whereas cancer may be scarcely at all relieved."

2. It may be perfectly true that increase of weight may follow "relief of dilatation of the organ by lavage, etc." But what is the cause of the dilatation? A carcinoma? Then that should be seen to at once. There is no time for investigation or lavage. If a tumour be there or even if there be doubt about the presence of a tumour, if the patient's life is to be prolonged the sooner a surgeon sees that case the better. If weight is being increased or even only sustained, there is no ground for immediate interference, but lavage will not for long keep up the weight of a patient who has a growing carcinoma, and therein it seems to me lies the fallacy. Medical men for some reason which cannot be explained appear to blind themselves with/

with regard to the possible presence, the frequency, and serious nature of this disease. It is not so with regard to malignant disease in other organs. The doubtful breast, the rectum, the suspicious tongue, the penis, the uterus, the lip are all immediately seen to. Why? perhaps because they are visible or palpable. What I venture to urge is a similar alacrity with the doubtful or suspicious stomach. Unless we have this we are not likely to progress. Results of operation are at present bad - but the cases come too late - it is the universal thing - except apparently in Germany. There they seem to be got earlier. What is most needed in medical practice is a type of mind which is more curious, inquisitive, and more imaginative (within reasonable bounds) and a courage to act on convictions. If a thing cannot be seen or felt, it cannot exist or be likely to exist - So reasons unfortunately, the ordinary medical brain of to-day with regard to gastric carcinoma. It is surely not much to ask of the youngest practitioner that he be ever alert and watchful for the suspicious case. Better be over-careful and wrong with regard to the diagnosis of carcinoma than ignore its possible presence/

presence.

3. As for "increase of weight after a profound mental impression" e.g. the gain of ten pounds after the visit of an optimistic consultant. The patient probably was encouraged to eat thereafter for a day or two - but we are not told if the increase was added to, sustained or eventually lost. With regard to increase of weight after exploratory operation the cases which came under my personal notice reported themselves (even though nothing was done) as "feeling better" and perhaps looked a little better for a time. But actual increase of weight is not common. Only one case do I know of i.e. T. L. who gained 7 lbs in 3 weeks though lost subsequently. Might the 70 lbs increase in Keen and D.D. Stewart's case not have been due to ascitic fluid? We are not told. Taylor says "indications of severe constitutional disturbance set in comparatively early in cancer of the stomach. The appetite diminishes, the patient loses flesh, strength, and colour; and in advanced conditions (unfortunately what we are accustomed to see so much of) emaciation and anaemia are extreme."

Hale White says "the loss of flesh in cases/

cases of cancer of the stomach is often more rapid than in that due to malignant disease of other organs; for to the wasting due to the disease itself is added that due to the lack of food, the vomiting, and the imperfect digestion." And again "considerable enfeeblement is very common, and, being nearly always much more marked than in cases of simple dyspepsia, is often of great help in diagnosis. If the patient live long enough he has the thin, dry, wrinkled skin so characteristic of cancer; he wastes to a skeleton, and his face is pinched and expressive of great suffering." The patient, he says "is excessively weak, the myotatic irritability is increased;" and again, "when the patient comes under treatment, the indigestion and vomiting may lessen, and careful diet and rest in bed may even lead to a little gain in weight. Hence he is often buoyed up by false hopes, and the physician may begin to question his diagnosis but (and these words are of great significance) it is a good general rule to be very slow to alter the diagnosis of cancer when it has been reached after a careful survey of the whole case. Any temporary improvement passes away, and the symptoms again begin/

begin slowly to increase in severity; the vomiting becomes more frequent, and the wasting is more marked."

The patients here described are not such as will stand much operative interference. Yet the average patient who is sent for operation weighs somewhere, in the case of males 7 - 9 stone, and, in the case of females 5 - 7 stone. All practically had lost weight in my series of cases - generally from 2 - 3 stone. (To weights of patients I have devoted a special column in my tables). Indeed so thin was the abdominal wall in many cases that great care had to be taken in incising lest the peritoneal cavity should be entered and the viscera injured. Again, the very lying upon the operation table for the short period of one to two hours in some cases caused pressure sores over the sacrum and iliac region, the skin owing to emaciation being so close to osseous structures, and the tissues so devitalised. Hale White in writing of the emaciation which occurs says "the patient may become so thin that, if the nursing be inefficient, a bed-sore may form and hasten his end."

They are most unsatisfactory subjects to operate upon. Healing is delayed so markedly in them/

them that deep skin sutures have to remain for fourteen days at least, and superficial sutures for several days more. If removed before this period, as I have unfortunately witnessed, the wound yields with unpleasant results.

It can readily be imagined that in them gastro-intestinal suturing is a matter of great difficulty. So oedematous and friable are the tissues sometimes that in spite of the greatest gentleness and care, the stitches cut out giving rise to peritonitis from leakage of contents. In my introduction, I have referred to the dangers from anaesthesia. In the operative after treatment, pulmonary conditions often give rise to great anxiety e.g., the supervention of bronchitis, pneumonia, oedema pulmonum and collapse.

In cases where the growth is ulcerated, the mere handling of the mass seems to be accompanied with great risk. For in cases where death has supervened within two or three days, and where post-mortem examination has followed, there is nothing else to account for the septic infarcts seen in the lungs, spleen, etc.; except the fact that during operative manoeuvres such had been caused by a process of embolism - originating in the septic and ulcerated/

ulcerated surface of the mass. The kidneys too, even if previously undamaged, are liable to cease secreting, so weak are the powers of nature.

(2) ANAEMIA.

This, says Osler, "is present in a large proportion of all cases, and with the emaciation gives the picture of cachexia. There is often a yellow or lemon tint of the skin".

This is the common condition in my series. This text-book picture - the yellow tint expressive of grave anaemia and the kindred conditions generally described, appear to me to be partly at the root of the hopeless condition in which such patients are found on their arrival in surgical wards. These descriptions apply to persons who have reached their last stage. One looks in vain for a hopeful outlook. It is surprising that men who go out into practice have this one dire picture of the gastric carcinoma patient ever before them - and that, arguing therefrom, they conclude that unless the case in point presents like features, it cannot be one of gastric cancer.

Osler gives the results of careful blood-counts in 59 cases, "in 3 the red corpuscles were above/

above 6,000,000 per cubic millimetre. This occurs in the concentrated condition of the blood in certain cases of cancer of the pylorus with dilatation of the stomach. (I cannot, however, say that any of the counts in my series shew it). The average count in the 59 cases was, 3, 712, 186 per cubic millimetre. In only 3 cases was the count below 2,000,000, and in none below 1,000,000. The average of the haemoglobin was 44.9 per cent. In only 9 was it below 30 per cent. In 62 cases in which the leucocytes were counted there were only 13 cases in which they were above 12,000 per cubic millimetre; in only 3 cases were they above 20,000." He further refers to " 7 cases in which the features of onset suggested a primary anaemia."

This primary anaemia seems to me to be the one disease with which gastric carcinoma may be confounded. But careful blood estimations will, as a rule, determine. One case I can distinctly recall. It occurred while I was Resident with Professor Wyllie, and in it the red cells numbered about 2,500,000 and the haemoglobin about 45% - no nucleated red cells were to be found. The patient had/

had an irregular temperature (some oral sepsis was attended to) and had been losing weight for some months. He was a middle-aged man. There was a history of trauma and there was epigastric tenderness but nothing to be found. He was seen by Professor Caird who, the blood condition being worse and the patient weaker, did not advise interference. He went home and a year later, I heard that he was much better and going about. He had been taking arsenic. Cases similar to this are those which present difficulty where the patient looks ill, but no vomiting or other gastric symptoms are present.

Taylor states that "occasionally the anaemia of cancer has been so marked and the local symptoms so slight, as to have led to the suspicion of pernicious anaemia; this is especially likely where the tumour is small or not easily reached. In such cases repeated examination of the abdomen must be made," and adds "the leucocytosis which is natural after meals is often absent in cancer of the stomach."

With regard to blood changes, Hale White says - "The patient is pale and sallow, rarely there is a slight increase in the number of red cells, but usually they number about 3,000,000 or 4,000,000, and/

and it is very rare for them to fall below 1,500-000; there are often a few poikilocytes, occasionally a few nucleated reds, but no megaloblasts. The haemoglobin generally falls more than the number of red cells, and hence a colour-index of about 0.6 is not uncommon. The leucocytes may be normal or diminished in number, but a slight increase up to say 12,000 or a little more is common, the increase is chiefly among the polymorphonuclear forms. Digestion leucocytosis is usually absent, but this is not peculiar to, or diagnostic of, gastric carcinoma as was once thought."

Beattie and Dickson state that "small, slow-growing malignant tumours unless they be the seat of inflammatory processes such as ulceration, or interfere with nutrition (e.g. by obstruction of the oesophagus by pressure), usually produce little or no appreciable alteration in the blood. With large, rapidly growing tumours, however, it is otherwise, especially if metastasis occurs.

In cancers of this description, a secondary anaemia, varying in severity from a mild to a/

a very severe type, may be present. A common degree of such anaemia is where the red cells number about four to three-and-a-half millions, but, in severe cases, they may fall to a much lower figure and come to simulate the condition in pernicious anaemia. The red cells appear to be more delicate and more easily destroyed than usual. Poikilocytosis is common, and, in some cases, may be very extreme. Nucleated reds are common, and are usually normoblastic in type, though megaloblasts are occasionally found in severe and advanced cases. The colour index is usually low in proportion to the number of red cells, i.e., they are pale and poor in blood pigment, even when a comparatively high count is found. The specific gravity of the blood is lowered, being usually roughly parallel with the amount of haemoglobin present (normally S.G. 1.059 or 1.060). Coagulability is generally little altered or, perhaps, slightly decreased.

Considerable attention has been given to the question of the presence or absence of leucocytosis in cases of cancer; and here, again, the results of investigation show wide divergence in/

in different cases, according to the nature and site of the tumour and the occurrence of secondary changes in it, and the other variable factors already mentioned. Leucocytosis may be absent or slight where the tumour is small and slow-growing but where the growth is rapid, and especially if wide-spread metastasis occurs, marked increase of white cells, particularly polymorphs, may be found. Similarly, where ulceration or other inflammatory processes supervene, leucocytosis resembling that due to ordinary inflammation, both with regard to the number and character of the white cells, is produced.

In some instances, however, notably in cancer of the oesophagus, unless inflammation or secondary spread occurs the number of the leucocytes may not only not be increased, but may be actually diminished, probably from interference with nutrition. Leucocytosis tends to occur in cases where there is haemorrhage, e.g., in gastric cancers . . . In cancer of the stomach without haemorrhage, ulceration, or metastasis, leucocytosis is relatively infrequent, and the normal digestion-leucocytosis, occurring after a meal, is usually absent - a phenomenon which, however/

however, is only of relative importance, as a similar absence of digestion-leucocytosis has been observed in catarrhal conditions of the stomach, and in cases of debility from other causes."

Henry, as quoted by Herschell, says - "Never have I seen a case of cancer of the stomach in which the count of the red cells fell below 1,500,000 per cubic millimeter, and in one of my cases, I counted 2,760,000 the day before death. Per contra, I have never seen a fatal case of pernicious anaemia in which the red corpuscles did not fall below 100,000." Herschell continues as follows - "I feel that I cannot lay too much stress upon the importance of the numeration of the blood corpuscles in obscure cases of stomach trouble, as by means of this we can in many cases, not only diagnose cancer but exclude other diseases besides pernicious anaemia." He then cites a case in which the diagnosis lay between gastric carcinoma, pernicious anaemia and chronic gastric neurosis, which the blood count taken along with the duration of the trouble clearly showed to be the last named.

With regard to the question of the Blood examinations in my series of 200 cases, I annex a tabulated statement showing the figures brought out as contrasted with those cited by Professor Osler: -

"GASTRIC" SERIES. (15 Examinations).

"PYLORIC" SERIES. (28 Examinations).

RED BLOOD (CORPUSCLES)	Highest 5,300,000 Lowest 3,500,000	Average = 4,407,500 (Osler = 3,712,186)	Highest 5,740,000 Lowest 3,450,000	Average = 4,434,615 (Osler = 3,712,186)
HAEMOGLOBIN	Highest 90% Lowest 30%	Average = 55.6% (Osler = 44.9%)	Highest 95% Lowest 40%	Average = 74% (Osler = 44.9%)
WHITE BLOOD (CORPUSCLES)	Highest 19,000 Lowest 6,000	Average = 10,025	Highest 13,000 Lowest 4,000	Average = 8,260

In no case did the Red Blood count approach	6,000,000	In 1 case did the Red Blood count approximate (viz: 5,740,000)	6,000,000
In no case was the Red Blood count under	3,000,000	In no case was the Red Blood count below	3,000,000
In no case was Haemoglobin below	30%	In no case was Haemoglobin below	30%
In 3 cases was the White Blood count over	12,000	In 1 case was the White Blood count above,	12,000
In no case was the White Blood count over	20,000	In no case was the White Blood count above	20,000

Taking the "Gastric" and "Pyloric" examinations together viz: 43, and striking the average, we have: -

Red Blood Counts	4,421,057	(Osler 3,712,186).
Haemoglobin	64.6%	(Osler 44.9%).
White Blood Counts	9,142	-

Examining these figures and comparing them with Osler's, an average of 4,421,057 red cell count per cubic millimetre considerably exceeds Osler's 3,712,186; an average of 64.6% of haemoglobin considerably exceeds Osler's 44.9%; while a white cell average of 9,142 is fairly normal. But let it be kept in view that Osler had 59 examinations to my 43. It will from the above figures be thought that upon the whole, my patients were in a better condition for operative interference than Osler's, yet it will be seen later that a vast majority were hopelessly ill and surgically unfit. It is interesting to note that those cases termed "gastric" have a: -

(1) lower erythrocyte count than those termed "pyloric".

(2) lower haemoglobin per centage than those termed "pyloric"/

"pyloric".

(3) higher leucocyte count than those termed "pyloric".

I may mention that of the 15 "gastric" cases, there were 10 inoperable and 5 died; while of 28 "pyloric" cases, there were 4 inoperable and 11 died. From which one gathers that (as one would expect) "pyloric" tumours are more suitable for surgical treatment, being more mobile and localised, than "gastric" tumours (which besides being more inaccessible, impair in greater measure the nutrition), and that no matter how easy of access, still there is a high mortality with all operations for gastric malignant disease even in the most skilled hands. If such are the results of operations for the relief and cure of cases of carcinoma of the stomach in patients with a fairly satisfactory condition of the blood (though the weight is scarcely satisfactory), and in cases the majority of which are "pyloric", and in a series in which perhaps the age is a trifle below the average incidence, it will be seen how necessary it is for an earlier type of case still, if any/

any progress in the line of eradication of this scourge is ever to occur. I cannot see, however, that those with the more impoverished blood in these cases fared worse as the result of operation than their more "plethoric" (if the term may be applied) neighbours.

(3) FEVER. "Among other general symptoms", says Osler, "may be mentioned fever"; - of his 150 cases, 74 showed fever. In only 13 of these was the temperature above 101°. In 2 it was above 103°; 15 presented fairly constant elevation of temperature; 8 presented sudden rises: 2 cases had chill, with elevation to 103° and 104°. "Chills," he says, "may be associated with suppuration at the base of the cancer."

Taylor does not discuss temperature.

Hale White says - "The patient's temperature is often low, but there may be a mild, usually irregular, degree of pyrexia; the cause of this is unknown."

With regard to my 200 cases, I have looked pretty carefully into the subject of temperature, for while with Professor Wyllie I was struck with the very/

very marked degree of subnormal temperature exhibited by several patients dying of inoperable abdominal cancer (e.g. liver and kidney) as well as of several typical medical-house gastric cancers. I refer to those in which the disease was very far advanced on the patient's admission. By subnormal, I mean temperatures which remain almost constantly at or a little above 96°F. I take it for granted that a chart of an ordinary patient shows in some cases a morning and evening temperature below "normal" - that normal being 98.4°F. - for instance from 97.3°F to 98.4°F. I have taken particulars as to temperature before operation in all of the patients in my series, treating as (a) subnormal those who whilst awaiting operation were markedly and irregularly below 98°F, (b) normal about 98.4, and (c) raised, irregular etc. all above 98.4°F.

Of 49 "gastric" cases, 32 were subnormal: 14 normal: and 3 irregular - one of these last had a slow forming peritonitis from a perforation.

Of 151 "pyloric" cases, 122 were subnormal: 26 normal: and 3 irregular - one of these had a slow forming/

forming peritonitis and had a high degree of pyrexia.

Of the total 200 cases, therefore, 154, or 77 per cent, were subnormal; 40, or 20 per cent., normal; and 6, or 3 per cent irregular.

This subnormal temperature appears to be a very marked feature in carcinomatous cases. But if it is remembered that these patients were, many of them, in the last stages of inanition, one is not surprised. It has probably no indicative value in the early stages - I do not expect that it has; but it is a certain accompaniment of the later stages of the disease. We have here another warning that it is too late. The figures show only too conclusively the condition in which patients are sent by many practitioners who confidently expect a curative operation to be performed, in cases, too, where the presence of a tumour had been recognised by them some months before.

(4). URINE. Osler says -

"there may be no changes throughout; in 65 of our cases there were no alterations, in 36 albumin was found, and in 34 albumin with tube-casts, Glycosuria/

glycosuria, peptonuria, and acetonuria have been described. Indican is common."

Hale White says, -

"the urine sometimes contains a considerable amount of ethereal sulphates, especially indican, peptonuria may appear, and, towards the end, a little albumin and a few casts."

With regard to my series of cases in most of which the urine was examined in the ordinary "student" manner i.e. for blood, albumin, sugar (in only a few was microscopical evidence elicited and further examination as to peptones, indican etc. carried out), I find that in only 7 cases out of the 200 was there albuminuria - 4 males and 3 females. This would point to a very good condition of the renal organs - an important thing in surgical operations of such magnitude. But withal, it will be later seen that in spite of this favourable condition, many succumbed. Radical operation was only performed on those cases in which the urea output was satisfactory i.e. over 5 or 6 grains per ounce on repeated examinations. As regards sugar, in no case, apparently, was it found (certainly in none of the cases I had charge of was/

was it present). I cannot find in any book or paper on the subject any mention of its occurrence. One would think that in cases of disease of the stomach (an organ which lies in such close proximity to the pancreas - between acute and chronic disease of which and diabetes mellitus or glycosuria, it is well known such an intimate relation exists) that occasionally the pancreas when invaded would give some urinary evidences.

Taylor, dealing with diseases of the pancreas says -

"the relation is not constant, and glycosuria is not always present in cases of acute or chronic pancreatitis or cancer of the pancreas, where the symptoms of the visceral disease are prominent and call for diagnosis and relief; on the other hand, in most cases of diabetes there are no other clinical signs of local disease of the pancreas."

That the pancreas is often involved is plain, as in 24 cases out of my 200 it was definitely invaded, and doubtfully so in many of the other 24 cases where posterior adhesions existed. Yet no evidence of pancreatic disease beyond that of emaciation common/

common to it and gastric disease by itself, was shown. 122 out of 1574 cases of secondary growths analysed by Welch were in the pancreas. There is no mention of signs of pancreatic disease.

In one of the cases at which I assisted, the disease (microscopically a columnar celled carcinoma) was excised along with a portion of invaded pancreas, and the patient is now - 15 months after operation - in excellent health. The urine was normal before and after operation. Another case, at which I assisted, was one in which the pancreas in part, the liver in part, along with the pylorus, part of stomach, and a foot and a half of transverse colon was excised; in which also a posterior gastro-jejuno-stomy, an appendicostomy, with closure of the stomach and the duodenal end, and an end to end suture of the colon were performed, yet the patient lived for 5 weeks, was shown, well, to the Medico-Chirurgical Society, but died 5 weeks later of cerebral complications. There was no evidence of pancreatic disease e.g. glycosuria, fatty stools, signs of lack of pancreatic tissue, or of perverted pancreatic function/

function. There were, however, 3 cases in which the pancreas had been interfered with at the operation in which a fatal issue occurred, and post-mortem, well-marked fat necrosis was seen. Cases who die comatose (see later) may be instances of a form of diabetic coma due to pancreatic implication.

Under the heading of urine, an interesting case is the following: - A male, aet. 60 of good family history, who took little alcohol, and who had always been healthy but for (?) appendicitis: 15 years before, complained of pain in the epigastrium and vomiting of seven months duration. Loss of weight and constipation were present. The urine and liver were normal. There was no palpable tumour. Weight 9 st. 2 lbs. Free HCl. was present, and much retained food. Temperature subnormal. At operation, an extensive carcinoma of the pylorus spreading on the body of the stomach was found. There were many glands up towards the liver. A posterior gastro-jejunostomy was performed and the patient died two days later without apparent cause. Post-mortem showed very well-marked congenital cystic degeneration of both kidneys and also a cystic condition of the/

the liver - the urine was normal as to urea and specific gravity, and although careful abdominal palpation revealed nothing before operation and, what is more strange, nothing was seen at the operation beyond the gastric condition, yet that abdomen was a pathological museum in itself.

In the female, catheter specimens of the urine got under all proper precautions are often necessary because of contamination - vaginal etc.

In some cases, the quantity of urine passed was scanty and thirst was great, but I cannot say that this was a common occurrence. In one case, in which no operation could be performed owing to the advanced state of the disease, there was jaundice, bile in the urine, and pale stools, evidently a common-duct involvement.

(5) OEDEMA. Osler says -

"swelling of the ankles is of frequent occurrence toward the close. In some cases there is even early a general anasarca usually in combination with extreme anaemia. The cancer is usually overlooked." And adds that "there are no special cardiac/

cardiac symptoms; the pulse becomes progressively weaker. Thrombosis of one femoral vein may occur, or, as in one of our cases, wide-spread thrombosis in the superficial veins of the body."

Taylor says -

"Cancer of the retroperitoneal glands causes oedema of the feet; or the same is brought about by thrombosis of the large veins."

Hale White says -

"In cancer of the stomach, as in all wasting diseases, thrombosis is prone to occur. It is most frequently seen in the left saphena or in the left femoral vein. The wasting may induce a fatty liver and a fatty heart, and death may be due to cardiac failure."

With regard to my cases, oedema of the ankles was only noted in two cases and oedema of the walls of the abdomen in one case. It is hardly to be wondered at - as when patients have reached this stage of the disease, a surgical ward is not thought of. In all cases in which oedema, ascites, definitely nodular livers and jaundice, glandular involvement,

involvement, large tumours, grave anaemia, and marked emaciation are present, operation is contra-indicated, unless of a palliative nature. In many cases, only when paracentesis abdominis is carried out is the real condition discovered.

(6) BOWELS. Osler says: -

"the bowels are often constipated. In only 12 cases in our series was diarrhoea present. In 2 cases, blood was passed per rectum."

Taylor says: -

"A growth at the pylorus commonly leads to constipation, but sometimes in carcinoma of the stomach there is diarrhoea, probably due to the passage of some of the decomposing contents of the stomach through the pylorus; if so, it indicates that the obstruction is not great."

In my series of 200 cases, taking firstly the 49 "gastric" cases, there were 25 in which constipation was marked, i.e. practically 50 per cent. In 4, diarrhoea was marked; in 1 alternating constipation and diarrhoea was present; in 3 the bowels were regular.

Of/

Of the 151 "pyloric" cases, constipation was marked in 87 cases or roughly 58 per cent; diarrhoea was marked in 10 cases; alternating constipation and diarrhoea in 8 cases; the bowels were regular in 12.

Taken together, therefore, out of 200, 112 showed marked constipation or 56 per cent (and to show that there is a definite change in this respect when carcinoma comes on at the pylorus in a previously healthy subject, one case may be cited, namely, that of a man whose bowels were formerly regular, who came complaining that the bowels only moved once in 8-10 days); 14 cases showed diarrhoea; 9 cases showed alternating constipation and diarrhoea; and in 15 cases the bowels were regular. These accord pretty closely with the observations of others. A sudden attack of diarrhoea was the first complaint in one case.

(7) NERVOUS SYSTEM. Osler says: -

"symptoms on the part of the nervous system are rare; consciousness is often retained to the end. Coma may occur similar to that seen in diabetes, and/

and is believed to be due to an acid intoxication."

Hale White merely says: -

"Welch points out that sometimes patients with gastric carcinoma die comatose." And again -

"The drowsiness and the delirium which have been observed may perhaps be due to toxic absorption from the foul contents of the stomach; indeed, we do not know how far such a cause may be concerned in the production of general symptoms."

In none of my series did a patient die comatose. Most cases at all suitable for admission to a surgical ward are not so far advanced, and if death supervene, it is usually due to more acute conditions. It would be interesting in such a case to have a careful urinary examination as to evidences of pancreatic disease.

(d). FUNCTIONAL DISTURBANCES.

(1) "Anorexia, loss of desire for food," says Osler, "is a frequent and valuable symptom, more constant perhaps than any other. Nausea is a striking feature in many cases; there is often a sudden repulsion at the sight of food. In exceptional/

exceptional cases the appetite is retained throughout."

Taylor holds that comparatively early in the disease the appetite diminishes.

Hale White says that -

"The loss of appetite and repugnance to food are usually well marked, and these are important early signs." And later; "the patient begins, in most cases, to complain of nausea."

In my series 12 "gastric" cases out of 49 had anorexia, i.e. "loss of appetite" or "went off food"; 4 had nausea. Of the 151 "pyloric" cases, 20 had anorexia very markedly - one of the first things they complained of; 8 had nausea; whilst in 3 the appetite had remained good even up to the end though they steadily lost weight. These were all males and were stout men to begin with. They had been ill for such a short time that probably it was too soon for them to show any marked diminution of appetite. They were all, however, inoperable cases, gastro-jejunosomy alone being performed. So that 32 altogether had anorexia and 12 had nausea - a total of 44/

illustrate

44 or 22 per cent. In them it was most marked and the earliest sign - best described as an aversion to articles of food to which, in their own words, they had "all their lives been particularly partial, and they could not understand this."

Next, we may take such symptoms as epigastric discomfort or uneasiness after food, fulness, distension, swelling or tightness in the epigastrium after food, weight, heaviness or load in the epigastrium after food, acid eructations, flatulence, heartburn, and waterbrash or pyrosis, and regurgitation of mouthfuls of food. These cases usually present a furred tongue and have an "earthy" hue of countenance, and the eyes are usually somewhat sunken.

Of the 49 "gastric" cases, 2 had epigastric discomfort or uneasiness after food; 6 a feeling of load, heaviness or weight; 3 a feeling of distension, swelling, tightness or fulness; 7 had eructations (three of these being foul-smelling - containing doubtless CO_2 and SH_2). In one of the latter as the patient was lighting his pipe, he had an eructation, which, being ignited, exploded with a crack, an occurrence which I remember to have heard Professor Wyllie illustrate/

illustrate by the case of a patient with pyloric obstruction who while similarly employed, had a foul eructation which setting free gases, the latter exploded and burnt the moustache. 9 of the cases with which we are dealing had flatulence: 2 heartburn: 5 water-brash or pyrosis: and 5 regurgitation of food (these being cardiac cases). Of cardiac cases there were 10. All showed the usual dysphagia - first of solids, then of semi-solids and latterly even of fluids. In one of the regurgitation cases the reaction was alkaline; in one much mucus; and in another much blood-stained mucus was present.

With regard to the 151 "pyloric" cases: - 15 had epigastric discomfort or uneasiness after food; 20 a feeling of load, heaviness or weight; 21 a feeling of distension, fulness, swelling or tightness; 17 had eructations (one of these being foul); 47 had flatulence; 10 had heartburn; 17 water-brash or pyrosis; 4 had regurgitation of food in mouthfuls (all lesser curvature cases).

Appended/

Appended is a detailed table of these cases.

110.

DISCOMFORT OR UNEASINESS. HEAVINESS. DISTENSION. ERUCTATIONS. FLATULENCE. HEARTBURN. PYROSIS. REGURGITATION OF WATER-BRASH. FOOD.

Gastric.	2	6	3	7 - 3	Foul	9	2	5	5
Pyloric.	15	20	21	17 - 1	Foul	47	10	17	4
TOTAL.	17	26	24	24 - 4	Foul	56	12	22	9

Card. Jesse curvature.

Discomfort /

Discomfort or uneasiness; load, weight or heaviness; distension, fulness, swelling or tightness are often given among the first symptoms and it will be seen that 67 or 33 per cent at least showed these and they occurred fairly early in their histories. With regard to the regurgitation of food, this is common in cases where the cardiac orifice is affected. But also in some cases where the lesser curvature is involved, there appears to be a kinking of the fundus or body by contraction perhaps, and thus a kind of stenosis is produced giving rise to the same regurgitant symptoms. In 4, marked gastric rumblings were complained of; - in many also there were borborygmi. These symptoms, in conjunction with pain and vomiting, which may also come on early, may be said to have occurred in patients who "did not know that they had a stomach before," and apparently caused the stomach to obtrude on their consciousness in the same way as palpitation of or pain over the heart often does in an early stage of cardiac disease.

(2) "Vomiting," says Osler, "may come on early, or only after the dyspepsia has persisted for some time. It occurred in 128 cases in our series.

At first it is at long intervals, but subsequently it is more frequent, and may recur several times in the/

the day. There are cases in which it comes on in paroxysms and then subsides; in other cases, it sets in early, persists with great violence, and may cause a fatal termination within a few weeks. Vomiting is more frequent when the cancer involves the orifices, particularly the pylorus, in which case it is usually delayed for an hour or more after taking the food. When the cardiac orifice is involved it may follow at a shorter interval. Extensive disease of the fundus or of the anterior or posterior wall may be present without the occurrence of vomiting. The food is sometimes very little changed, even after it has remained in the stomach for twenty-four hours."

Taylor says: -

"In the earliest stages there is nothing characteristic about the symptoms, which are chiefly those of dyspepsia. There are discomfort, fulness, weight or pain after food, and acid eructations or flatulence. The pain may be at the epigastrium, or in the position of heartburn; small quantities of food may be regurgitated. After a time vomiting/

vomiting takes place, at first only at long intervals, then weekly, or two or three times a week."

"In the early stages," says Hale White, "the tongue is furred, the patient complains of a sense of fulness and heaviness in the gastric region, and often of pain and eructations." And later, "When these dyspeptic symptoms have lasted some time, the patient begins, in most cases, to complain of nausea, commonly succeeded by vomiting, which, unlike that of most other gastric affections, usually does not completely relieve the pain, although he feels more comfortable after it. This symptom is present in 87 per cent of the cases. It is most troublesome when there is some stenosis of the pylorus; and it bears more relation to the volume of the contents of the stomach than to the ingestion of food."

In my series of cases vomiting occurred in 23 of the 49 "gastric" cases, and in 118 of the 151 "pyloric" cases, or 146 out of 200, i.e. 73 per cent. In 3 of the 23 "gastric" cases, it was mostly night vomiting, and copious, and in 32 of the 151 "pyloric" cases/

cases, i.e. a total of 17.5 per cent. This is apparently always a copious vomit, in some cases amounting to three times the amount taken at the previous meal, sometimes the breakfast, dinner, and tea being in great part ejected. The patient perhaps has gone to bed feeling uneasy as to the epigastrium, and awakening from sleep about midnight or in the early hours of the morning, brings up great quantities of brown, brownish yellow, yellowish, or yellow-green material, in which perhaps can be recognised particles of food taken days before, and in one case which I had, taken even 14 days before. It often smells horribly - 'foul' or 'rancid' often being the qualifying words used by the patients. It may be bitter, setting the teeth on edge, and may froth on standing. Relieved of this accumulation, which had been giving rise to the foul eructations before described, the patients sink back in bed exhausted, and fall asleep. If pain has been present, it is, as a rule, relieved. The patient usually feels hungry in the morning and takes a good meal. Blood, if present, cannot, as a rule, be seen by the naked

naked eye - so dirty, foul, and copious are the contents evacuated. In many cases, the food is quite unaltered. In these cases, like those of simple pyloric stenosis, many pints of fluid are required in cleaning the gastric organ preliminary to operation. In one case, in my experience, I had washed out the stomach (the greater curvature of which it was difficult to determine) the night before, and, though I thought I had got it fairly clean, yet the next morning after using two large pailfuls of fluid with very partial success, the patient having had merely a slice of toast and a cup of tea in the interval, several **currants** which had been taken a fortnight before appeared. Two other cases showed grape-skins and barley taken days before.

Hale White says: -

"The vomited matter is faintly acid, dark brown, often smells very disagreeably, and in exceptional cases stinks horribly, when it has undergone butyric acid fermentation or, in rare cases, putrefaction. Under the microscope pieces of undigested food (which may have been swallowed days or weeks before/

before), crowds of micro-organisms - especially sarcinae, blood-discs fresh and altered, and, in excessively rare cases, cells derived from the growth may be seen. If vomiting is frequent and only small quantities are brought up the growth may be infiltrating the whole stomach and contracting it (india-rubber bottle stomach), and if absent it is more likely to be mural than pyloric. If dysphagia be present the growth is probably at the cardiac orifice, but this symptom may be absent even with a growth in this position."

Taylor says: -
 "the vomited matters consist of food in different stages of digestion, mixed with more or less mucus, or streaks of blood. Often the blood mixed with the vomit has the appearance of coffee-grounds"

"Microscopic examination of the gastric contents", says Hale White, "may provide valuable information; fragments of growth may be found especially in the eye of the soft tube used, blood-cells may often be seen when the blood is not visible to the naked eye, and in stained specimens the Oppler-Boas bacillus may be observed. Probably it like lactic acid/

acid is only indicative of fermentation." And again - "In about 35 to 40 per cent of the cases the vomit at some time or another contains blood visible to the naked eye. This is due to the ulceration of the growth, and when fatal there is often ulceration into some large vessel, e.g. the splenic artery. If the bleeding be slight, the blood may remain in the stomach long enough to be partially digested; the vomit then looks like coffee-grounds. On the other hand, the haemorrhage may be profuse, and a quantity of bright red blood may be ejected at once; but this is not so common as the "coffee-grounds vomit". Melaena is not very frequent, for it often happens that the pyloric obstruction prevents the blood from reaching the bowel. Gastric haemorrhage from carcinoma of the stomach is rarely fatal."

Osler says speaking of the stomach contents, - "the vomitus in suspected cases should be carefully studied, particularly as to quantity and character of ingredients. Large amounts brought up at intervals of a few days, with the appearances already/

already described, are characteristic of dilatation of the stomach. Some of the material should be spread in a large glass plate and any suspicious portions picked out for examination. Bacteria in large numbers occur, one, the Oppler-Boas bacillus - an unusually long non-mobile form - is supposed to be of diagnostic value, and to be largely responsible for the formation of lactic acid. The yeast fungus is very commonly found, sarcinae less frequently than in dilatation from stricture.

Blood is a most important ingredient; the persistent presence microscopically of red corpuscles in the early morning washings is always very suspicious. Later, when coffee-ground vomiting takes place, the macroscopic evidence is sufficient.

In cases of doubt the spectroscope may be used or the test made for haemin crystals. Fragments of the new growth may be vomited or may appear in the washings. Positive evidence of cancer may be obtained from them."

The vomiting which usually causes the most rapid emaciation is that which comes on fairly soon after the food has been taken. It usually succeeds pain/

pain which comes on immediately or perhaps not for an hour or two after ingestion. It contains food - as a rule unaltered - with a varying quantity of clear or greenish fluid or mucus, and perhaps blood-streaks. It often has a bitter taste, and relief is got at once. The patient may induce vomiting to get relief, and this is done usually by women, who tickle the back of the throat and apply pressure over the gastric area. 8 patients stated they they habitually did this; 25 stated that the vomit was very sour, "setting the teeth on edge"; 36 stated that severe pain which had been present was at once relieved; 2 had streaks of blood markedly present for some weeks; several had stringy masses of mucus with the ejecta. As regards melaena, 3 "gastric" cases had had it since their illness began, and 17 "pyloric" cases = 20 or 10 per cent. Melaena was the first symptom in one case - coming on suddenly and melaena following a faint and haematemesis in one other. In two cases of Osler's 150, blood was passed by the rectum. As regards the acids and the bacilli of the stomach contents, these will be dealt with under examination/

examination of test-meals. In two cases squamous epithelial cells were found.

(3) Haemorrhage. Osler states that -

"haemorrhage occurred in 36 of our 150 cases; in 32 the blood was dark and altered, in 3 it was bright red. In 2 cases vomiting of blood was the first symptom. The bleeding is rarely profuse; more commonly there is slight oozing, and the blood is mixed with, or altered by the secretions, and, when vomited, the material is dark brown or black, the so-called 'coffee-ground' vomit. The blood can be recognized by the microscope as shadows of the red blood-corpuscles and irregular masses of altered blood pigment. In cases of doubt the spectroscope may be employed or haemin crystals obtained."

Taylor says: -

"abundant haemorrhages are much less common than in ulcers; but a large vessel, such as the splenic artery, is sometimes eroded, and profuse and fatal bleeding results."

Hale White says: -

"the/

"the growth in the stomach is, by the time death occurs,, ulcerated in three-quarters of the cases, and by its ulceration it may open a large artery; death may then result with profuse arterial haematemesis, but this is rare. Guy's Hospital Museum contains a specimen in which the splenic artery was thus laid open. Ulceration into the spleen has caused fatal haematemesis from that organ. Out of Perry and Shaw's 306 cases bleeding caused death in 11, in 6 of these there was haematemesis, and in the other 5 the autopsy showed that gastric haemorrhage had proved fatal without any vomiting of blood."

In my series of 200 cases, of the 49 "gastric" cases, during the course of their latter illness 7 had vomiting of bright red blood (5 males and 2 females), and 5 had vomiting of dark and altered blood (4 males and 1 female) = 12; while of the 151 "pyloric" cases, 4 had vomiting of bright red blood (3 males: 1 female), and 33 had vomiting of dark and altered blood (16 males: 17 females) = 37. I have elsewhere (page 23) given a table of cases in which previous haematemesis and melaena had occurred a varying/

varying number of years before, and I have given those as possibly illustrating the fact that carcinoma, in some if not all of them, had arisen on the site of an old ulcer, healed or unhealed. The total, then, of 11 cases of bright red, and 38 of dark and altered blood ("coffee-ground") vomit = 49 out of 200 or 24.5 per cent is quite analagous to Osler's 36 out of 150, which is 24 per cent.

The age is almost exclusively over 45, and the males predominate. As already brought out (page 72) in 1 "gastric" case, sudden haematemesis was the first symptom; in 2 "pyloric" cases, a fainting with haematemesis; in 2, acute pain with sudden haematemesis; and in 1 sudden faintness and haematemesis followed by the passage of blood per rectum, were the first symptoms.

The occurrence of sudden haemorrhage is very interesting, and it is often seen in cases of simple gastric ulcer. While engaged in scrubbing the floor perhaps - if it be a woman, or in carrying some load - if it be a man, or, perhaps, while sitting quietly in a chair, the patients feel faint and a sickly/

sickly feeling of dizziness comes over them. This is due probably to the rupture through erosion of the vessel wall, aided by strain, and blood being poured into the stomach, the cerebral circulation is depleted, a cerebral anaemia is produced, and the patient bringing up bright blood falls forward in a dead faint. From this he slowly recovers, perhaps more quickly if left lying, the rapidity depending on the amount poured out and the size of the vessel. Perhaps if a small vessel is affected, a gradual oozing occurs, and the patient may feel faint but does not vomit outright; or he may have no such feeling, and sometime after, varying in length in different cases, the blood is brought up (perhaps with the next food taken) like "coffee-grounds", altered blood, acted upon by the contents of the stomach. If the vessel be at the pylorus or upon the duodenal side of the pylorus, there may be no haematemesis, (e.g. duodenal ulcer). but a sudden melaena, which also may cause a sudden fainting attack as above described. If the melaena does not occur for some time, it may be very puzzling to make out what has occurred, the only signs at the first being those of profound internal/

internal haemorrhage and collapse - e.g. ruptured aneurism, ruptured spleen, embolism of the mesenteric vessels, sudden cardiac failure, or in a female, ruptured ectopic gestation or concealed accidental haemorrhage (if below or about 45). The melaena, however, which will come on sooner or later, (if the patient recover, as he or she usually does), will explain in most cases what has occurred. In one case, melaena came on after a sudden haematemesis and faint.

With regard to the sex of the patients, 28 were males; 21 were females.

The occurrence of haematemesis, though perhaps at too late a stage for the carrying out of radical treatment, may be helpful in diagnosis in persons over 45 years of age with a previously clean gastric history, the occurrence of simple ulcer beyond this age being rare. It will be seen (pp.23,23a) that of those with old histories pointing to ulcer, there were, in the "gastric" series 1 male and 1 female; in the "pyloric" series, 7 males and 8 females. The average age at which the first sign of ulcer occurred was, in the "gastric" series, 26.5 years, and

56 when carcinoma probably began. The average age at which the first sign of ulcer occurred was, in the "pyloric" series 42.5 years and 52 when carcinoma probably began.

It is interesting to note that in the case of the males in the "pyloric" series, the average age at the first sign of ulcer was 43; of carcinoma 55.5 years; and that in the case of the females in the same series, the average age at the first sign of ulcer was 37.7; of carcinoma 48.7 years.

When one takes both series together, it would appear that the average age at the first sign of ulcer was 40.6; of carcinoma 52.4; i.e. between the first sign of ulcer and the first sign of carcinoma, a period of 11.8 years elapsed. In the case of the males, the average age at the first sign of ulcer was 45.2 and of carcinoma 56.7 - the interval being thus 11.5 years; and in the case of the females, the average age at the first sign of ulcer was 36.5 and of carcinoma 48.6, the interval being thus 12.1 years.

(4) Pain, says Osler, is "an early and important symptom," and it was present in 130 of his cases. "It is very variable in situation," he writes, "and while most common in the epigastrium it may be referred to the shoulders, the back, or the/

the loins. The pain is described as dragging, burning or gnawing in character, and very rarely occurs in severe paroxysms of gastralgia, as in gastric ulcer. As a rule, the pain is aggravated by taking food. There is usually marked tenderness on pressure in the epigastric region. The areas of skin tenderness are referred, as Head has shown, to the region between the nipple and the umbilicus in front and behind from the fifth to the twelfth thoracic spine."

In the earliest stages, says Taylor, there may be pain after food which may be "at the epigastrium, or in the position of heartburn." Later it "becomes a more prominent symptom, and though, like the other symptoms, at first related more or less closely to the ingestion of food, it soon becomes more constant, or arises independently of a meal. It commonly radiates from the epigastric region, where it is, in later stages, most intense, and is occasionally felt between the shoulders, or in the lumbar region. It is often stabbing, and lancinating, but may be boring, burning, gnawing, or tearing/

tearing."

Hale White says: -

"Pain of some sort or another is almost constant, and is responsible for the drawn look, expressive of much suffering, which the face of a patient suffering from cancer of the stomach usually shows. It is present at some period of the illness in about 90 per cent of the cases."

"Of this pain there are three varieties," he continues, "namely, that due to the indigestion, that due to the cancerous growth, and that due to distension; but it is very difficult to separate them. When, however, the pain is principally between the shoulders, and is benefited by taking food, it is probably dyspeptic. The pain characteristic of the cancer itself may be very severe, but speaking generally it is not so extreme as is that of ulcer; it is principally felt in the epigastric region, but it may radiate widely. Except in the early stages it is usually continuous, and may or may not be altered by the ingestion of food; but, independently of this, it often varies in/

in severity from time to time, and may even be paroxysmal. Patients describe it differently, but generally it is either a wearing pain, or it shoots; in the latter case it is agonising, and may then be as severe as that of an ulcer, and it is almost always increased by pressure. That due merely to distension of the stomach is usually relieved when the stomach is emptied either by vomiting or lavage. The pain of a gastric malignant tumour bears no relation to its size, the depth of ulceration, or the rapidity of growth. The stomach probably gets its sensory nerve supply from the 6th, 7th, 8th and 9th dorsal segments; the 6th and 7th furnishing the cardia, and the 9th the pylorus. Hence, referred pain from a gastric carcinoma is often felt over those areas of skin which, as Dr. Henry Head has shown, correspond to these dorsal segments; that is to say, in front from just below the nipple to the umbilicus, and behind from just below the 5th to just below the 12th dorsal spine. Further, the cutaneous tenderness - generally best demonstrated by pressure with the head of a pin, which/

which, if the tenderness be excessive, makes the patient flinch or even cry out - may often be elicited over these areas when the stomach is diseased. Each area has points which are more sensitive to this pressure than the rest of the area." He gives examples and continues: -

"When the stomach is diseased these tender spots may be very evident; but cutaneous tenderness is of less value in gastric carcinoma than in other diseases of the stomach, for cases of malignant disease are complicated by the presence of tender areas due to secondary deposits in other organs: moreover, in long-standing and exhausting diseases, pains often radiate far beyond the areas usually associated with the affected organ. Many patients complain of pains in the head, and the scalp should be tested for local tenderness. Dr. Head has shown that there are painful and tender areas on the scalp which correspond to dorsal cutaneous areas; and they may be the seat of pain and tenderness when either is felt in its corresponding dorsal area."

These are very interesting phenomena.

In/

In my series of 200 cases - of 49 "gastric" cases, 39 complained of pain. In 32 of these it was epigastric, and in most of them described as in the pit of the stomach; in 7 it was hypochondriac. Of the latter, in 5 it was referred to the left hypochondrium, in 1 to the right, and in 1 to both hypochondriac regions. In 5 cases, pain was most severe at the lower end of the sternum; in 5 it passed through to the back; and in 1 it shot to the left shoulder.

Of the 151 "pyloric" cases, 131 complained of pain at some time or other. In 111 of these, it was epigastric; in 15 hypochondriac; and in 5 umbilical. Of the hypochondriac cases, in 10 it was left-sided, in 5 right-sided. Of the umbilical cases, in 3 it was left-sided, in 2 it was right-sided. In 4 cases, the pain was described as shooting up through the chest; in 1 it was most severe at the lower end of the sternum; in 16 it passed through to the back; in 4 it shot to the left shoulder, in 1 to the right and in 1 to both shoulders; in 1 case it was referred to the left loin.

Taking "gastric" and "pyloric" cases together, we have a total of 170 who complained of pain, which is 85 per cent. This agrees closely with/

with the percentages stated by Hale White and Osler, who give 90 per cent (about) and 86.6 per cent respectively.

So much for the presence and situation of the pain. It was described as gnawing, griping, dull, boring, severe, lancinating, cutting, tearing, sharp, shooting, burning, or dragging. In most cases it was aggravated by taking food, more especially solid food, e.g., butcher meat. In 12 cases it was relieved by taking food, and the pain was most severe when the stomach was empty. In only 1 of the "gastric" cases was this so, however.

These patients were in the habit of keeping a biscuit at their bedsides during the night, so that when the pain came on, they got immediate relief by taking such, one or two asserting they found that if they took anything more, vomiting came on, which emptying the stomach, again brought on the pain. In 1 "gastric" case, the pain bore no relation to the ingestion of food; in 7 "pyloric" cases the pain occurred at irregular times, and had no marked relation to the taking of food, and did not seem to be relieved by taking more, but by vomiting relief was got. In many cases there was tenderness on pressure over the gastric/

gastric region at these times; 2 patients stated that pressure caused great pain; 1 stated that the pain was relieved by pressure. One stated that it was aggravated on taking a long breath. Several stated that it was eased by taking a little bicarbonate of soda. Heat or cold did not seem to affect it much. As regards position, 2 stated that they got relief by lying on the left side. In 3 cases, the pain was said to be constant, though aggravated by taking more food. The occurrence of pain in regions other than the stomach is most important, as it may be caused by secondary deposits, e.g., in the case of the girl of 22, in whom a severe pain in the left shoulder - more acute than the epigastric and left loin pain where a tumour was palpable - was present. This, of necessity, must have been at a very early stage of its growth, as the contour (she was very thin) did not differ from that of the other side.

With/

With regard to the time of onset after food, -

in 23 cases it was almost immediately after (9 "gastric" and 14 "pyloric");

in 7, it was from 5 to 30 minutes after (2 "gastric" and 5 "pyloric");

in 19, it was from $\frac{1}{2}$ to 1 hour after (4 "gastric" and 15 "pyloric");

in 14, it was from 1 to 2 hours after (2 "gastric" and 12 "pyloric"); and

in 4, it was from 2 to 4 hours after (1 "gastric" and 3 "pyloric");

These are cases in which it was definitely stated; in many others, the time varied.

(5) Hiccough. The occurrence of hiccough in cases of gastric carcinoma I have not seen mentioned in any text-book, but in two "gastric" cases which came under my own observation, this symptom (I will call it so) was present.

Carr (29), writing of gastric irritation as a cause of hiccough, says:-

"The gastric irritant may be actual organic disease, such as gastritis or cancer. The latter is particularly apt to excite hiccough when it reaches the peritoneal coat of the stomach, or when it involves the lower end of the oesophagus, perhaps/

perhaps from its proximity to the diaphragm."

(c) Examination of the Test Breakfast.

Osler says, "As an outcome of the enormous number of observations made of late years, it may be said that free Hcl is absent in a large proportion of all cases of cancer of the stomach. Of 94 cases in which the contents were examined, in 34 free Hcl was absent. In 5 undoubted cases the reaction was good; in 2 of these the history suggested previous ulcer. Hcl may be absent in chronic gastritis, and in atrophy of the gastric mucosa. The presence of lactic acid after Boas' test meal is regarded as a valuable sign."

Taylor says "the absence of free hydrochloric acid from the contents of the stomach is not peculiar to cancer, but its presence on repeated examinations is an argument against that disease. Lactic, butyric and acetic acids are likely to be present from dilatation, and fermentation of the contents."

Hale White says "much attention has been directed to the kind of acids present in the gastric contents in cases of gastric carcinoma. . . . Many tests have been recommended for the/

the detection of free hydrochloric acid in the stomach contents." "It has been clearly shown" he continues, "by numerous researches, that when a patient is suffering from a carcinoma of the stomach, the secretion of free hydrochloric acid is nearly always greatly diminished, unless the examination be made very early in the disease. The diminution is so great that many authors have said that the acid is entirely absent in about nine-tenths of all cases; but while it is often absent, careful quantitative estimations have shown that it would be more accurate to say that it is nearly always very considerably reduced in quantity. Lactic acid is frequently present in the gastric contents in cases of carcinoma, but like other organic acids that may be also found, it is only due to the decomposition of the contents of the stomach, and therefore is most often found when pyloric obstruction is present. Free hydrochloric acid may be greatly reduced in conditions other than carcinoma, especially atrophy of the gastric mucous membrane, chronic gastritis, and febrile disorders, although it is impossible to say whether all the diseases which have been said to cause a great diminution/

diminution really do so, for the statement is often made without the corroboration of a quantitative analysis. Still, great reduction or absence is so much commoner in gastric carcinoma than in these conditions, that either is of great value in diagnosis; although in a small number, probably under 10 per cent, of the cases of gastric carcinoma free hydrochloric acid is present. Riegel is of opinion that this is sometimes because carcinoma has developed on the site of a previous ulcer, and Osler and McCrae state that the continued presence of hydrochloric acid, sometimes in large amounts, has been repeatedly shown in connexion with carcinoma developing in a previous simple ulcer; but, as already pointed out, Osler and McCrae found no evidence that carcinoma was especially liable to develop on an ulcer, and at any rate the liability must be very small. The diminution of hydrochloric acid in cases of gastric carcinoma is not only greater than in other conditions, but is often comes on remarkably early in the course of the disease, and it is to be particularly noted that it may be well marked when/

when the gastric growth is small and localised."

He then deals with researches made by Professor B. Moore and Dr. Morton Palmer, who bring out results, which, he says "make us wonder whether malignant growths, wherever situated, may not form an internal secretion which, passing into the blood, inhibits the formation of hydrochloric acid by the stomach; if so, this will explain the severe wasting that occurs in malignant disease. . . ."

"If", he contends, "the suggestion that the absence of free hydrochloric acid is in part the cause of the wasting in cancer be correct, it may be that the wasting of other illnesses in which the free hydrochloric acid is reduced may be due to the diminution of acid."

Free lactic acid is not common in the gastric contents, unless the patient be suffering from cancer of the stomach, and in this disease it is often present. Manges found it in 20 out of 21 cases; Ewald found it in 22 out of 24; but Straus found it in 5 only out of 12 non-malignant cases of gastric disease. It is merely the result of the retention and consequent bacterial decomposition of the gastric contents. In doubtful cases it is of the greatest importance to search/

search for hydrochloric and lactic acids."

Herschell in his book says:-

"In about 10 per cent of cases of cancer of the stomach, the gastric juice remains practically normal in respect to acids and ferments until near the end of the case. In about 20 per cent hypochylia develops slowly and does not reach its maximum until late in the disease, but in the remaining cases, over 60 per cent, hypochylia begins early and develops rapidly (Van Valsah). The diminution in the Hcl secreted depends partly upon destruction of glandular tissue by the invasion of the cancerous cells, partly upon inhibition of the glandular work of the stomach by toxins secreted by the cancer, but is mainly due, as Riegel has pointed out, to the presence of an associated chronic gastritis.

The cases in which the gastric secretion remains normal will either be those in which we have an old ulcer becoming cancerous, or cancer affecting the cardia. In most cases first of all the free Hcl commences to diminish day by day until it finally disappears.
The important point to bear in mind is that to establish/

establish the probability of malignant disease, we must find a progressive deterioration of the gastric juice, and this can only be established by a series of examinations extended over a considerable period of time. We may also learn that it is not sufficient to make out the mere fact that Hcl is absent in the free state, we must measure the actual Hcl deficit. Another point to bear in mind in investigating these cases, is that the Ewald test breakfast is not sufficient, as we require a test meal which contains meat."

Talking of lactic acid, he says:-

"Whenever we find stagnation of food in the stomach, in association with deficiency of Hcl, there we shall find lactic acid and the micro-organisms which produce it."

He quotes Riegel, who said:-

"In heart disease auscultation is valuable, but not sufficient to make a diagnosis, and in stomach disease a determination of the Hcl alone is not sufficient. Only in combination with the subjective symptoms of the patient, the determination of the size and position of the stomach, its/

its motor and absorbing powers, is the determination of Hcl of value."

But are these foregoing authorities (with whose results mine will be seen to agree), are not indeed all authorities, when dealing with this question of the presence or absence of free Hcl, not dealing, like myself, with cases of gastric carcinoma in the latter stages of the disease - stages in which clinical appearances alone are sufficient in diagnosis?

With regard to my cases - which were unquestionably late in receiving treatment - of 49 "gastric" cases, 25 examinations showed as follows:-

Absence of free Hcl as shown by Gunzburg test	=	21.
Diminution " " " " " " "	=	3
Excess " " " " " " "	=	1

In several others, the tube could not be introduced into the stomach on account of the disease of the cardiac orifice. In two cases, the tube was only introduced with difficulty, and in one of them it was found on withdrawal to be blood-stained. In three cases, residual food was present. In two cases, red blood corpuscles were found microscopically; in four, starch granules; in two, sarcinae; in/

in one, nucleated round cells. In four cases where hour-glass formation existed, it is possible that the proximal pouch alone was "tapped". One of the cases in which the Hcl was diminished is of the greatest interest - it is that of the man already referred to (page 24), who was aged 51, and had only a three months' history.

Of 151 "pyloric" cases, 113 examinations showed as follows:-

Absence of free Hcl as shown by Gunzburg test	=	79.
Diminution " " " " " "	=	27
Merest trace " " " " " "	=	3
Excess " " " " " "	=	4

Microscopically, in 9 cases, torulae were found; in 7, sarcinae; in 8, red blood corpuscles; in 6, starch granules; in 4, Boas-Oppler bacilli; in 1, squamous epithelial cells. As regards the other acids, in 9, lactic, in 6, butyric and in 2, acetic, were found. In 34, much retained food was present after test meals. Such are the results as noted in the case-books.

Taking the two series together, we have a total of 133 examinations, with the following results:-

Absence/

Absence of free Hcl as shown by Gunzburg test = 100.
This is 72.4% (cf. Osler's 89.5%).

Diminution " " " " = 33
or 23.9%.

Excess " " " " = 5
or 3.6%.

From this it will be seen that a total of 96.3% showed an absence or diminution of free Hcl to the Gunzburg test. I have no doubt that many of the "absence" cases would quantitatively have shown small quantities of free acid, but in most, the clinical appearances were so obvious that a rough test sufficed.

I have heard a surgeon say that in 80% of cases of gastric carcinoma, free Hcl is absent, but that it is often absent in cases of scirrhus mammae, etc., while in other cases, the fact of a previous ulcer is said to cause an excess of free Hcl where a carcinoma has grown upon the site of such ulcer.

One can glean from a survey of the cases, that those in which free Hcl was present or even diminished, were in a better condition for operation and stood operation better than those in which free Hcl was absent.

(f)/

(f.) PHYSICAL EXAMINATION. (1) Inspection.

I think that Osler's words here are very apt. He says, "after a preliminary survey, embracing the facies, state of nutrition, etc., particular direction is given to the abdomen. An all-important matter is to have the patient in a good light. Fulness in the epigastric region, inequality in the infracostal grooves, the existence of peristalsis, a wide area of aortic pulsation, the presence of subcutaneous nodules or small masses about the navel, and lastly, a well-defined tumor mass - these, together or singly, may be seen on careful inspection. I cannot emphasize too strongly the value of this method of examination. In 62 of the 150 cases a positive tumor could be seen [i.e., about 41.3%]. In 52, the tumor descended with inspiration [i.e., about 34.6%]; in 36, peristalsis was visible [i.e., about 24%]; in 3 cases movements were visible in the tumor itself [i.e., in about 2%]. In 10 cases with visible peristalsis, no tumor was seen, but could be felt on palpation. Inflation with carbonic acid gas may be tried, except when haemorrhage has been profuse or the cancer is very extensive. The dilatation/

dilatation often renders evident the peristalsis, or may bring a tumor into view. The presence of subcutaneous and umbilical nodules is sometimes a very great help. They were found in 5 of our series." (See later for palpation, etc.)

Taylor says, and he speaks of tumour which is so commonly seen or felt in the later stages:-

"In the majority of cases, a tumour is discovered at some time or other; but rarely in the first three or four months. The position, of course, varies with the part of the stomach affected. A pyloric tumour is commonly situated in the middle line, or a little to the right, midway between the ensiform appendix and the umbilicus, but it may be close to the umbilicus, or more to the right of the middle line; indeed, almost anywhere in the triangle formed by the right costal margin, the middle line, and a horizontal line running through the umbilicus. When the stomach is much dilated, the tumour is even below the umbilicus. It varies in size from that of a walnut to that of a small orange, is generally very hard, sometimes globular, but often somewhat square, and mostly irregularly nodular. It is at first freely movable, and descends on inspiration, but in later/

later stages it may contract adhesions and become more fixed. It frequently receives an impulse from the underlying aorta. On percussion it is dull or imperfectly resonant; handling it causes pain, which may last for some time afterwards.

The condition of the abdomen varies. As a result of the small quantity of food that passes the pylorus, it is frequently empty, but presents in many cases the prominence in the upper or left portion which is due to dilatation of the stomach. Dilatation is further recognised by the peristaltic wave of contraction, the varying resonance and dulness on percussion according to the amount of the contents, the splashing sounds heard on movement, and the characters of the vomited matter." [Before described]. "Though the pylorus," he continues, "is very frequently the seat of gastric cancer, it must not be forgotten that it occurs in other situations, and that there will be some differences in the symptoms and physical signs in accordance with these. Thus, a tumour in the back of the stomach may grow to a large size without being felt; or it may be felt, but is mistaken for a kidney. The signs yielded by a general infiltration of the gastric walls are very obscure. In all these cases/

cases dilatation is not present, as it is in so many cases of pyloric cancer. The pain may be also rather in the left loin or back than in the epigastrium. The tongue is often clean, but in the last days may be dry and covered with sordes or deposits of thrush."

Hale White says, and, like Osler's, his words are weighty, "it is frequently possible to feel a malignant tumour of the stomach, but this clearly depends upon its position, its size and the thickness and degree of relaxation of the abdominal wall. To feel a tumour of the stomach to the best advantage, the patient should be on his back, with his knees drawn up; he should breathe deeply and keep his mouth open. If, now, the abdominal muscles are not relaxed, his attention may be distracted by making him talk. If it is still impossible to form a satisfactory opinion, it may be necessary to give him some chloroform. The examiner's hand should always be warm, [this, a good light, a good eye, time and patience are essentials], and should be moved slowly and evenly over the abdomen. A malignant tumour of the stomach is hard, tender, and often irregular. It varies/

varies very much in size, but it slowly increases. Usually a dull note is obtained over it, but sometimes on deep percussion an obscurely resonant note may be heard. Inflation of the organ with gas may render the tumour more easy to detect. The pylorus can hardly ever be felt in health, so that if this part can be made out by palpation, it is pretty certainly diseased. If enlarged, it is usually felt under the outer part of the right rectus, or at the right border of it; but although tumours of the pylorus are, as a rule, much more fixed than those in other parts of the stomach, owing to the close attachment of this structure to the liver, yet not infrequently these attachments stretch, and the tumour becomes freely movable over a range of as much, it may be, as three or four inches, so as to suggest the presence of a floating kidney; but it is more usual for tumours of the stomach to become more and more fixed, as in the course of time they form more numerous and denser adhesions. A tumour of the pylorus moves up and down with the liver in respiration, and it is usually impossible, either by palpation or percussion, to separate it from the liver. / but this note of investigation often helps

liver. It must not be forgotten that even an enlarged pylorus is frequently so covered by the liver that it cannot be detected during life. If the growth be on the anterior surface and along the greater curvature, it is more easy to detect, is more mobile under the hand, and alters its position when the stomach is distended with gas; but it does not move so freely with respiration. If, as is sometimes the case, it forms a mass along the greater curvature, we feel a hard, irregular, tender tumour running transversely across the abdomen above the umbilicus. This is very liable to be confounded with a thickened, puckered omentum, such as occurs in chronic peritonitis of any form, or with a growth in the colon, or the thickened lower edge of a diseased liver. Tumours limited to the cardia can seldom be felt. The stomach may be distended with carbonic acid gas, if the patient swallows first a solution of bicarbonate of soda, and then some lemon juice, and sometimes this may help diagnosis, for we may, when the stomach is distended, be the better able to tell whether a tumour is in its wall, and also whether the tumour is adherent to surrounding organs; but this mode of investigation often helps very/

very little, and some patients dislike it. If a pyloric tumour move as the result of inflation, the change of position is to the right and a little downwards; if inflation render a tumour previously palpable no longer tangible it is either in the posterior wall of the stomach or behind that organ. A tumour of the stomach is sometimes large enough to form a visible projection of the abdominal wall; and towards the end of the case, when the patient is very wasted, it may sometimes be seen to ascend and descend with respiration, frequently making a considerable excursion. The dilated stomach is often visible, and well-marked peristalsis of it may be seen. If the growth lie over the aorta, it may be lifted up and down by the pulsations of this vessel. In those cases in which a hard growth infiltrates the whole of the stomach-wall (india-rubber bottle stomach), a hard mass may be felt lying across the abdomen in the epigastric angle, the vomit is small in amount and occurs soon after food, and the organ cannot be inflated."

Osler, continuing, says with regard to (2) Palpation, "In 115 cases a tumor could be felt, [i.e., about 76.6%]; in 48, in the epigastric region,/"

region, in 25, in the umbilical, in 18, in the left hypochondriac, in 17, in the right hypochondriac region, while in 7 cases a mass descended in deep inspiration from beneath the left costal margin. These figures illustrate in how large a proportion of the cases the tumor is in evidence. In some cases examination in the knee-elbow position is of value. Mobility in gastric tumor is a point of much importance. First, the change with respiration, already referred to; a mass may descend for three or four inches in deep inspiration; secondly, the communicated pulsation from the aorta, which is often in its extent suggestive; thirdly, the intrinsic movements in the hypertrophied muscularis in the neighbourhood of the cancer. This may give a remarkable character to the mass, causing it to appear and disappear, lifting the abdominal wall in the epigastric region; and, fourthly, mechanical movements, with inflation, with change of posture, or communicated with the hand. Tumors of the pylorus are the most movable, and in extreme cases can be displaced to either hypochondrium or pushed far down below the navel. Pain on palpation is common; the mass is usually hard, sometimes/

sometimes nodular. Gas can at times be felt gurgling through the tumor at the pyloric region.

(3) Percussion gives less important indications - the note over a tumor is rarely flat, more often a flat tympany. (4) Auscultation may reveal the gurgling through the pylorus; sometimes a systolic bruit is transmitted from the aorta, and when a local peritonitis exists a friction may be heard."

With regard to my series of cases, I will deal with them after Osler's manner and begin with Inspection:- In most of the "Gastric" cases, the patients were emaciated, sallow and anaemic, with bad teeth, furred and brownish-dry tongues and thin-walled, tumid or flabby, scaphoid or retracted abdomen - the skin of which, thrown into folds, signified loss of weight in most cases. In 6, a visible tumour was present. In 9, epigastric fulness - in one or two cases the infra-costal groove being filled up. In several of the cases, the tumour was seen to rise up and down with respiration. In 5, marked epigastric pulsation was present. In 3, there was so much distension from ascites, that all signs of tumour were obscured, but in one of these, distended coils of intestine/

intestine were seen. In two cases peristalsis was seen. In one of these, it was left to right and evidently gastric, coming from below the left costal margin, and passing downwards and to the right. This was a case of hour-glass affection of the body of the organ, and was caused by contractions of the proximal pouch. In the other, the peristalsis was from right to left in the region of the umbilicus. This was diagnosed as being due to contractions of the transverse colon, although the patient had well-marked gastric symptoms, and although it is known that right to left gastric peristalsis does occur. Operation showed that a gastric carcinoma had also involved the splenic flexure of the colon, setting up a slight stricture of the gut. This in time, perhaps, would have become one of these cases of gastro-colic fistula.

As regards the "pyloric" cases, the general condition is on the whole a little better, but still the patients are here also emaciated and sallow. In 23, a visible tumour was present. In 40, there was epigastric, umbilical, or hypochondriac fulness; in 18, epigastric pulsation was evident. In 2 cases, free fluid was present in such amount that nothing could be discovered. In 26, well-marked/

well-marked left to right peristalsis was seen.

Taken together, therefore, in 29, a visible tumour was present. This is 14.5%, which is a very small percentage when compared with Osler's 62 out of 150, or 41.3%. But then, I have 49, or 24.5%, in which definite fulness, visible in the epigastric, hypochondriac or umbilical regions, was present, and of these many no doubt were due to tumour, although the records do not definitely say so. In many, the tumour was seen to rise and fall with respiration. In 23, epigastric pulsation was present, i.e., 11.5%. In 5 cases, ascites prevented careful examination, i.e., 2.5%. In 28 cases, or 14%, well-marked epigastric, hypogastric, or umbilical peristalsis (left to right) was seen.

With regard to visible tumours, these were best seen when the patient was asked to breathe deeply, and in most cases were either in the mid-line or came down from below the right costal margin. In many cases, however, the growth was anchored by adhesions below the liver, and so this may explain the small number, comparatively speaking, of visible tumours. Unfortunately, the growth in some cases had assumed such large proportions, that a different reason/

reason of visibility presented itself, its inherent size and the accompanying emaciation of the patient rendering it more conspicuous. In several cases, and I had opportunity of observing closely some of these, the range of movement was about one to two inches. Tumours of the anterior gastric wall and greater curvature, transverse meso-colon and transverse colon, were naturally more visible than those of the posterior wall and lesser curvature. Probably Osler's marked number of visible tumour cases was due to the fact of their being well advanced. It is difficult to determine accurately how many of the visible tumours in my series rose and fell with respiration, as the term is used in such a manner that it might have applied to palpability, not to visibility. The presence of pulsation is very useful in many cases, as, if one excludes a dilated right ventricle, epigastric pulsation high up is not common in ordinary circumstances with the patient supine, and thus a tumour even on the posterior wall may be pushed forward and so palpated more easily. In the ascites cases, no doubt paracentesis abdominis would have revealed visible masses - I have frequently seen this. As to peristalsis, this most important sign, I fear, is often/

often overlooked, because a long enough period is not devoted to a careful inspection of the abdomen under different circumstances. Most medical men are aware of the beautiful peristalsis of cases of congenital hypertrophic stenosis of the pylorus in infants, and the time that must be spent, and patience exercised, in the diagnosis in many cases, e.g., giving a feed and waiting, etc. The same thing is demanded here, and often the peristalsis is so clear that the patient himself feels "as if a ball were passing" over the upper abdomen, and will show by the hand the very direction followed. One can further hear a gurgling in the region of the pylorus in such cases, similar to the "squirting" sound occasionally heard in infants. Also, at the height of this storm of contraction, the patient may experience pain, and lastly a tumour, previously under the costal margin or in some other obscure region, may be brought into such a position during the contraction, as to be felt or even seen. All these signs may be detected by a careful scrutiny in a good light, provided the examiner has patience to look for them. Efforts aiming at relaxation of the muscles must be exercised, for it is often noticed/

noticed upon the operation table that marked peristalsis, though never previously seen, is present under an anaesthetic. By this peristalsis also the size of the stomach can be estimated, and in some cases I have seen by its means the lower border of the organ to be several inches below that point where skilled fingers had determined it. With inspection also, such things as dilated veins may be seen coursing over the surface of the abdomen, showing perhaps that some impediment to the venous return exists. In 8 cases these were seen. In 26 cases, the teeth are said to have been bad, but in most people of the hospital class this is so, especially if over 40 or 45. With this subject I have previously dealt (pp. 41, 42).

In concluding the subject of inspection, I would say that in my 20 cases last winter, I noticed the presence of small scattered superficial naevi in 6 cases. These, if I remember rightly, I heard Professor Chiene state some years ago, he had often seen in cases of malignant disease, and I think Mr. Chiene mentioned that this had been pointed out by Dr. Abercromby. I have since looked for these carefully, and have found them in two cases of cancer of the uterus, 9 cases of cancer of the stomach./

stomach, 2 cases of cancer of the rectum, 2 cases of cancer of the sigmoid flexure, 4 cases of cancer of the breast, 3 cases of cancer of the tongue, 1 case of cancer of the jaw, and 1 case of cancer of the penis.

Palpation. Of 49 "gastric" cases, there was a palpable tumour in 27. In 15, the tumour was situated in the epigastric region; in 5, in the umbilical region; in 3, in the left hypochondriac region; in 3 in the right hypochondriac region; and in 1 in the left lumbar region. Of these, 13 were felt to move up and down with respiration; 5 were associated with a plainly felt communicated pulsation from the aorta; in 13 cases there was epigastric resistance; in 26 tenderness in the epigastrium; in 8, the tumour was mobile; in 2 cases the recti were so tense that nothing could one make out by palpation; in 6, splashing was elicited; in 5 cases the liver was enlarged, so that its lower border could be palpated, and in 3 of these cases, nodules could be felt on its edge. In 2 cases the tumour could not be felt at times, while it was easily palpated at others. In one case definite edges were found to the mass. In one case three separate masses were felt - one in the epigastrium, one/

one in the right hypochondrium, and one in the right lumbar region. In another case, the main mass was associated with a smaller mass on the fifth rib below the breast, and there were axillary and right supra-clavicular glands. Another case in which masses other than the main mass were also present was that of the young woman of 22, whose case I have before described (pp 66a, 67 & 68) and who had masses on the ribs, left humeral head, on the scalp and left scapula. The tumours of the cardia are practically never felt, nor are those of the fundus; whilst those of the body are as a rule in the epigastrium, or come down from below the left costal margin or the subcostal angle on deep inspiration, or are in the left hypochondrium or left lumbar region, where they may closely simulate an enlargement of the spleen or left kidney. In the case of the young girl of 22, an enlargement of the left kidney was the first diagnosis. The tumour most often lies obliquely from left to right, or transversely, in consistence is hard and stony or wooden, and varies in size from that of a walnut to a duck's egg. In almost all the cases the mass seemed to be fixed, and was tender on pressure.

of/

Of the 151 "pyloric" cases, there was a palpable tumour in 95 cases. In 49, it was situated in the epigastric region; in 20, in the umbilical region; in 10, in the left hypochondriac region; in 15, in the right hypochondriac region; and in 1, in the left lumbar region. In 50 cases the mass was felt to move up and down with respiration; 18 were associated with a communicated pulsation from the aorta; in 38, there was epigastric resistance; in 68, there was epigastric tenderness; in 33, the tumour was mobile; in 22, the recti were so tense that nothing could be made out by palpation - in 17 of these it was the right rectus, in 3 it was the left, and in 2 both recti. In 35, splashing was elicited; in 6 cases the liver was enlarged, and in 3 of these, nodules were felt upon its edge; in one it was smooth, and yet at the operation several nodules were found. In 3 cases there was an interval between the hepatic and gastric masses. In one case - a perforated carcinoma - the liver dulness was diminished on percussion. In 5 cases, the mass varied greatly in position and often was not to be felt at all. In one case, it was only felt when the patient lay upon the left side, presumably then/

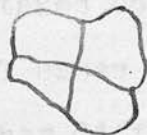
then coming from under the right costal margin. In 3 cases definite edges were made out, as follows:-

(1) right and lower, but not left and upper, (2) lower edge, (3) the right, not the upper, left or lower.

In 5 cases, gurgling occurred on firm palpation. In one case, slight epigastric tenderness was the only sign got on careful examination of a patient whose age and history were suggestive of a carcinoma, and on opening whose abdomen an inoperable mass was found. This evidence of tenderness is often of the greatest importance; the patient wincing at once, when slight pressure is exercised over the subcostal angle area. In 1 case, multiple masses were found over the abdomen, buttocks and back. Pyloric tumours, for the most part, are right epigastric in position when the patient is supine, and may be got in the right hypochondrium or right loin, especially if the patient lie on the right side. They may similarly come from below the right costal margin if the patient lie upon the left side, or come into the umbilical or lower epigastric region if the patient sit or stand up, but examination is then hampered by the taut abdominal muscles. They may simulate mobile right kidney, or enlarged gall-bladder. Both these conditions I have seen diagnosed

as/

as gastric carcinoma. These conditions are usually simulated in the mid-stage of the disease, when, as yet, the palpable tumour has not contracted firm enough adhesions to anchor it - say under the liver, in the region of the gall-bladder, or, if more on the posterior wall and lesser curvature of the antrum, in the pancreatic region. The tumour may be smooth, but more often nodular, irregular, or stony hard. It may be round, oval, oblong, or square. It is usually tender, but may be painless. It may be fixed, not moving up and down with respiration or capable of being in any way moved by the hand. It varies in size from that of a marble, walnut, or sausage, to that of a pigeon's, hen's, or goose's egg, or even a small tangerine orange, or apple, immediately post-partum uterus (which occurred in one of my cases), or even a foetal head. Most often, it is sausage-shaped and lies transversely or obliquely from below, up and to the right, or it may even lie perpendicularly. In one of my cases it was quite easily made out to consist of four pieces, thus.



at the operation.

and this was confirmed

It is most often to the right of the mid-line, and in one case was easily measured to be $2\frac{1}{2}$ inches broad, = two-thirds lying to the/

the right, and one-third to the left of the mid-line.

Thus we have, taking the two series together, $27 + 95 = 122$ palpable tumours, or 61% (cf. Osler's 76.6%). Of these 64 were epigastric, or 52.4%. There were 25 umbilical, or 20.4%; 13 were in the left hypochondrium, or 10.6%; 18 were in the right hypochondrium, or 14.7%; and 2 were in the left lumbar region, or 1.6%.

I append a regional analysis of the cases of palpable tumour in Osler's cases and in my series.

<u>Osler, 115 out of 150.</u>		<u>My series, 122 out of 200.</u>	
Epigastric	= 48.	Epigastric	= 64.
Umbilical	= 25.	Umbilical	= 25.
Left hypochondriac	= 18.	Left hypochondriac	= 13.
Right hypochondriac	= 17.	Right hypochondriac	= 18.
From the left costal margin	= 7.	Left lumbar	= 2.
	<u>115.</u>		<u>122.</u>

Like Osler's, my cases also show in how large a proportion a tumour is palpable.

If one takes both series together, i.e., 350, there are 237 cases in which a tumour was palpable. It is rather difficult to say whether the palpability of the tumour is a good or a bad sign. Certainly, in my series in most cases, it was not the/

the palpability of an early (mobile) case, so to speak, but that of a terminal condition, in which, after anchorage by adhesion, the growth, by its very size, had been palpable. I think that palpation in cases of gastric, especially pyloric, cancer can be put under three headings, according to the stage of growth of the tumour.

1. Early cases, where the pylorus is free, yet invaded, and with care perhaps palpable.
2. Mid cases, where the pylorus is under the liver, or puckered up by adhesions - with difficulty palpable, or not at all.
3. Late cases, where the first two stages have been gone through, where the growth has assumed large enough proportions as to be easily made out.

It is a rare thing to get the first and second stage cases sent for operation, perhaps for three reasons:- (1) That there is neglect of efficient palpation. (2) That, if palpated, the mass is supposed to be a thick pylorus, and perhaps an anatomical or physiological condition. (3) That, if palpated, it is due to the contraction of an ulcer, with consequent thickening, and that it is unimportant./

unimportant. Only when the case has assumed a more serious aspect will it occur to many that their conclusions are at fault, and then it is probably too late.

With regard to the difficulties encountered in palpating tumours, especially those of the cardiac region and fundus of the stomach, it is important to remember the anatomical relationship of these portions of the organ where carcinoma most commonly develops.

"The cardiac orifice is deeply placed, being about four inches from the surface, behind the sternal end of the seventh left costal cartilage;" (30) "the pyloric orifice is from three to four inches (8-10 cm.) below the xiphisternal articulation, and, when the stomach is contracted, in or immediately to the right of the median plane; but when the stomach is distended, the pyloric end moves considerably to the right. The pyloric orifice is much nearer to the surface than the cardiac." (31)

When one remembers the above anatomical facts, it will be conceived how much more easily carcinomata of the pylorus and pyloric antrum (greater curvature) are discovered than those of the lesser/

lesser curvature, fundus and cardia.

In repeated and thorough examinations, at different periods of the day, in a good light, and, as a matter of course, with the patient nude, lies, I think, the crux of abdominal diagnosis - the secret of success in difficulties. Many of the cases of carcinoma of the stomach in the upper classes fail to be detected, either through delicacy on the part of the patient or of the medical man, and this, it seems to me, is where the hospital class of patient scores - for here there are no encumbrances, and repeated examinations are made by a series of observers. By quietly laying the warm hand on the upper part of the abdomen whilst conversing with the patient, one may occasionally feel the gastric organ rising up in "rigid spasm", in cases in which this phenomenon may not be visible. I cannot find in my series any mention of a subcutaneous mass in the region of the umbilicus, such as described by Osler, being felt.

Percussion. Osler dismisses this rather summarily, I think, yet by it much may be learned. Of the "gastric" cases, 7, and of the "pyloric" cases, 23, had marked dulness on percussion, i.e., 30, or 15%. In these it was probably the result of/

of percussion over a tumour, but certainly I have seen one or two cases in which at a comparatively early stage the note has been quite typically flat, as if, so to speak, the "drum had been perforated", and this is probably due to the solution of continuity in the reverberating cavity, whose walls at one point are perhaps invaded, and where the sound is deadened to a great extent. This, along with a vague tenderness on deep palpation in the subcostal angle, with rigidity of the upper part of the right rectus (but may be the left, or both), I have found in cases of lesser curvature disease high up, where no opportunity of seeing or of feeling anything is possible. By percussion also, in most cases, though not in all, we can form an accurate idea of the size of the gastric organ - at any rate, its lower border can be approximately determined. In 11 "gastric" cases out of 17, in which the lower border was stated, it was at a varying distance above the umbilicus - from $\frac{1}{2}$ to 2 inches. In 25 "pyloric" cases out of 62, it was also above. In 5 "gastric" cases it was at or about the level of the umbilicus, while in 28 "pyloric" cases it was similarly placed. In only 1 "gastric" case was it below, and that was $1\frac{1}{2}$ inches, while in 9 "pyloric" cases it was below, the/

the distances varying from $\frac{1}{2}$ to 2 inches. In some other cases it could not be determined. So that, we have of 79 examinations, 36 were above: 33 at or about: and 10 were below the umbilicus. A varying point, it is true, but used in the ordinary sense as a standard of comparison. I have already mentioned (page 55) the case where the pylorus lay below and to the right of the umbilicus, and the gastric organ in the left iliac region and stood up from time to time like a distended sigmoid. I have seen, too, a case in which only a week before operation, the skilled physician determined the lower border of the stomach as being 2 inches below the umbilicus, and yet, at the operation, it was well-nigh an impossible feat to get the gastric organ delivered from below the rib margin with a view to performing a gastro-jejunostomy, so pulled up and adherent was the whole organ - a markedly small one, so small indeed that no matter in what stage of dilatation it had been, could it have appeared from below the ribs. Whether the colon was what had been percussed or no, I know not. Many medical men seem to think that the stomach must lie in the epigastrium, and fairly low down too, and that when in percussion from above downwards, they/

they get a change in note, it must be produced by another viscus, perhaps the colon, and that on the occurrence of the change the lower border of the stomach has been reached. To prove, however, how fallacious in some cases such a supposition may be, I have, on looking into abdomens, seen the transverse colon well up, and prominent in the epigastric region, while no stomach was observable, and I have further seen stomachs so far to the left, under the spleen, so to speak, that no percussion would have easily elicited their whereabouts. And finally, I have seen transverse colons far down, almost in the hypogastric region. No one, then, can dogmatise in any given case that the lower border of the stomach is situated at such a point, that here lies the colon, the small intestine, etc.. In the same way, a man might conclude

"this is cholecystitis", because a patient has pain in the region of the gall-bladder, and yet he might perhaps be in great error, if he forgets that in some cases the appendix has not descended with the caput caecum coli from its rudimentary position. We must always be on our guard, and be alive to such possibilities. Lastly, percussion is/

is useful in telling us if a given mass is continuous, or not continuous, with the liver. There may be a groove of resonance between the latter organ and the mass, and in one case, the hepatic dulness had quite disappeared in a case where the carcinoma had ulcerated through the stomach wall, giving rise to the presence of free gas in the peritoneal cavity.

With regard to Auscultation. Sitting at the bedside and listening attentively, one may hear gurglings in the stomach. In 6 cases these were heard with the stethoscope, or by direct auscultation they may be heard more clearly. By combined auscultation and percussion, or by the "scratching" method, one may, in a manner, determine the size of the gastric organ.

C O M P L I C A T I O N S .

- (1) "Secondary growths" says Osler, "are common. In 44 autopsies in our series there were metastases in 33; in 29 the lymph-glands were involved; in 23 the liver, in 11 the peritoneum, in 3 the pancreas, in 3 the bowel, in 4 the lung, in 3 the pleura, in 4 the kidneys, and in 2 the spleen. In 3 no deposits were found/

found."

With regard to secondary growths, I have previously given these: - (page 58), and have there quoted several writers. The fact that the lung, pleura, kidneys, and spleen were invaded in only 44 autopsies would seem to point to the patient's having been in a worse condition than most in my series. Certainly, if pulmonary or other metastases were present it was at such an early stage as to produce no symptoms otherwise operation would not have been considered. So that upon the whole, perhaps there would seem to be a general improvement in the attitude of the profession both as regards the earlier recognition of the disease and the necessity for surgical treatment.

(2) Perforation. Osler says "In the extensive ulceration which occurs perforation of the stomach is not uncommon. It occurred into the peritonaeum in 17 of the 507 cases of cancer of the stomach collected by Brinton. In our series perforation is recorded in 4 cases. When adhesions form, the most extensive destruction of the walls may take place without perforation into the peritoneal cavity. In one instance which came/

came under my observation a large portion of the left lobe of the liver lay within the stomach. Occasionally a gastro-cutaneous fistula is established. Perforation may occur into the colon, the small bowel, the pleura, the lung, or into the pericardium." Elsewhere he says "Perforation may lead to peritonitis, but in 3 of our 4 cases there was no general involvement. Cancerous ascites is not very uncommon. Dock has called attention to the value of the examination of the fluid in such cases as a help to diagnosis. The cells show mitosis and are very characteristic. Secondary cancer of the liver is very common; the enlargement may be very great, and such cases are not infrequently mistaken for primary cancer of the organ. Involvement of the lymph-glands may give valuable indications. There may be early enlargement of a gland at the posterior border of the left sterno-cleido-mastoid muscle; later adjacent glands may become affected. This occurs also in uterine cancer. According to Williams, Trosier was the first to describe this condition, which must not be confounded with the pseudo-lipome sus-claviculaire of Verneuil.

A very remarkable picture is presented when/

when the cancer sloughs or becomes gangrenous; the vomitus has a foul odor, often of a penetrating nature, to be perceived through the room. In cases in which the ulcer perforates the colon, the vomiting may be faecal. I have, however, met with the faecal odor in a case with incessant vomiting; there was no perforation of the colon at autopsy."

Hale White, whom I have quoted before as to complications when dealing with symptoms, continues thus - "Abscesses not due to actual perforation may arise in connexion with the growth. Often these are only found at the necropsy; but there may be a collection of pus in the subphrenic region large enough to be detected during life. In some cases rigors occur; these are usually due to suppuration, but it is said that both rigors and pyrexia may occur in its absence. Not infrequently the patients appear too weak to shew any signs of suppurative processes."

As already quoted above "the drowsiness and the delirium which have been observed may perhaps be due to toxic absorption from the foul contents of the stomach; indeed, we do not know how far such a cause may be concerned in the production/

production of general symptoms. Perforation occurs in about 7 per cent of the cases; it happened in 20 out of Perry and Shaw's 306 cases; other authors do not put the percentage quite so high, but it must be remembered that it is often overlooked in the absence of an autopsy. In 13 of the 20 cases perforation took place into the general peritoneal cavity; if the patient be very weak and exhausted when this happens there may be no evidence during life of this event. In the remaining 7 cases perforation took place among adhesions, and a local abscess followed; in two there was an abscess between the pylorus and the liver, in one the abscess extended from the liver to the spleen, in one it was in the lesser sac of the peritoneum, in one over the lesser curvature of the stomach, in one between the abdominal wall and the stomach, and in one the position is not stated. Such abscesses may lead to a communication between the stomach and the colon. Thus faecal vomiting may be set up with a horrible taste in the mouth and odour of the breath; but if the stomach be constantly distended and full of fluid, there may be no passage of the contents of the colon into it. In about/

about a third of the cases of gastro-colic fistula undigested food may be observed in the faeces; whenever food appears soon in the faeces in an undigested state the condition is termed lientery, but this may occur when there is no fistulous communication. Other fistulas are extremely rare; but there may be a communication between the stomach and duodenum, or a gastro-cutaneous fistula may form. Adhesions in connexion with the growth are very common, being found in about two-thirds of the cases examined after death."

He continues, "It is clear that several of these complications may kill the patient; but not uncommonly he appears to die slowly from sheer weakness, lying during the last few days of his life quite still, almost pulseless, and with hardly any respiratory movements. I have often noticed that, as Fagge points out, many of the symptoms diminish towards the end; the pain is less, and the vomiting stops; but I do not know that this remission is peculiar to cancer. Near the end of any exhausting disease all the functions of the body, even the conducting power of the nerves are depressed; consequently no pain is felt, and reflex acts fail. I have seen cases of/

of perforation in enteric fever and in cancer of the caecum in which during life there had been no signs to lead one to suspect what had happened. Welch points out that sometimes patients with gastric carcinoma die comatose. Carcinoma of the stomach is especially rapid in young subjects." In one "pyloric" case, perforation was

discovered. With regard to my series, it must be remembered that at least the majority were surgically fit, and if not so, were transferred elsewhere. Terminal complications, therefore, e.g., coma, gastro-colic fistula, and even oedema of the feet were not seen. As regards secondary growths, I have already given their occurrence (page 62), but I add the following notes, which were found at post-mortems.

Of the "gastric" cases among them, 3 showed hepatic involvement, 1, pelvic growth, 1, small intestine invasion, 1, extensive glandular invasion. In one, there was marked disease of the cardia, and also, about 6 inches higher up in the oesophagus, an annular carcinoma. In another, there was a large abscess in the splenic region, the spleen containing thick black pus. As regards the "pyloric" cases, 3 showed hepatic involvement, 2, pelvic growths./

growths, 1, pancreatic growth, 1, omental invasion, 2, glandular involvement, 1, diaphragmatic mass.

(a) Cervical. Perforation occurred in none of the "gastric" cases, though in one of these the mass was on the point of perforating.

In one "pyloric" case, perforation was diagnosed from signs of peritonitis, and turbid fluid was found on operation, with a perforation in the lesser curvature. In another case, amidst adhesions, a perforated pyloric mass was found, and the patient died on the second day, of septic pneumonia.

In two other cases, lymph was found, as if a small leak had occurred.

As regards glandular enlargement found on examination of the patients before operation, the following were found to exist:-

"Gastric"/

(b) Inguinal, 4 cases.

1. Right side.
2. Both sides.
3. Both "
4. Both "

(c) Axillary, 4 cases.

1. Left side.
2. Both sides.
3. Both "
4. Both "

With regard to supra-clavicular invasion, as none of the glands were examined microscopically, a definite opinion as to malignancy cannot be given. In cases I personally have seen, enlarged glands were of more frequent occurrence on the left side, except where the liver was involved, when the right side predominated. This may have been accidental, but the fact remains.

is from three to six months, as from six to twelve months, - a total of 45 cases up to 1903. Some cases lasted for two years or over. But none lasted for at least two years and a half.

According to Hahn, "A malignant tumour of the stomach, when cancer of the liver, unless it be successfully treated, is a fatal disease. It is not unusual to find that life may be prolonged for even two years after the onset of symptoms, but it is

always difficult to say how long the patient will live. It is not safe to say that life is rarely prolonged more than eighteen months, or at the outside two years, after the patient is first led to consult a doctor for the symptoms of this disease. The duration of the greater number of cases is much less than

COURSE and PROGNOSIS.

Osler says, "While usually chronic and lasting from a year to eighteen months, acute cancer of the stomach is by no means infrequent. Of the 69 cases in which we could determine accurately the duration, 15 lasted under three months, 16 from three to six months, 14 from six to twelve months - a total of 45 under one year. Four cases lasted for two years or over. One case lived for at least two years and a half."

According to Hale White, "A malignant tumour of the stomach must sooner or later kill, unless it be successfully removed. A few exceptional cases have been recorded which appear to show that life may be prolonged for even four years after the onset of symptoms, but it is always difficult to be sure that the early symptoms were due to the growth, and it may safely be said that life is rarely prolonged more than eighteen months, or at the outside two years, after the patient is first led to consult a doctor for the symptoms of this disease. The duration of the greater number of cases is much less than/

than eighteen months, and often is less than a year; indeed, the average duration is only nine months, and with very many it is much less. A great deal depends upon the rate of growth of the tumour and the rapidity with which secondary growths form. Under careful dieting and rest in bed, improvement may occur for a time. This is particularly likely if the sufferer is a hospital patient who has not had good food and rest outside the hospital, and forgetfulness of this has often led to mistakes in diagnosis."

Pearce Gould, whom I have quoted before, says, "Of all conditions which influence the rate of progress of cancer in any particular site, I know of none more potent for mischief than the youth of the individual."

As examples of this, I would again cite Canney's case in a youth of nineteen, and that of the young woman of twenty-two in my own series. In the latter, secondary growths were actually seen daily to increase in size.

Taylor, writing on Prognosis, states.

"This is very unfavourable, but perhaps less so now that cancer of the stomach has come within the range of practicable surgery. But it often happens that by the time the tumour is first/

first felt, and when the symptoms are scarcely enough to alarm, the lymphatic glands have become involved, and the chance of benefit from operation no longer exists."

In my series of cases, the following periods were given as the duration of the illness of the patients:-

<u>"Gastric" Cases.</u>		<u>"Pyloric" Cases.</u>	
-		1 month	= 2 cases.
-		2 months	= 13 "
3 months	= 3 cases.	3 "	= 17 "
4 "	= 1 case.	4 "	= 8 "
5 "	= 3 cases.	5 "	= 14 "
6 "	= 14 "	6 "	= 19 "
-		7 "	= 6 "
8 "	= 4 "	8 "	= 4 "
9 "	= 7 "	9 "	= 9 "
10 "	= 1 case.	10 "	= 4 "
11 "	= 1 "	11 "	= 1 case.
12 "	= 7 cases.	12 "	= 19 cases.
-		13 "	= 1 case.
14 "	= 1 case.	14 "	= 2 cases.
-		15 "	= 2 "
18 "	= 1 "	18 "	= 2 "
24 "	= 3 cases.	24 "	= 8 "
-		30 "	= 3 "
36 "	= 3 "	36 "	= 5 "
	<u>49</u> "	4 years	= 1 case.
		5 "	= 1 "
		7 "	= 2 cases.
		8 "	= 1 case.
		10 "	= 1 "
		11 "	= 1 "
		12 "	= 2 cases.
		17 "	= 1 case.
		20 "	= 2 cases.
			<u>151</u> "

Taking/

Taking both together, -

6 months and under = $21 + 73 = 94$.

7 months to 1 year = $20 + 43 = 63$.

1 to 2 years = $5 + 15 = 20$.

2 to 3 years = $3 + 8 = 11$.

Over 3 years = 12.

200.

So that, -

Under 6 months there were 94, or 47%.

Under 1 year " " 157 " 78.5%.

Under 18 months " " 166 " 83%.

Under 2 years " " 177 " 88.5%.

Let it be kept in view I am dealing with the duration of the illness when the patient came under surgical observation, and thus it is no index of the complete course of the disease. Most of the cases with histories over 18 months or two years, especially those with long histories (suggestive of chronic ulcer), stated that for the last six months they had failed markedly.

DIAGNOSIS/ For in its early stages, it is a local disease, and, while, it may be, nothing can be done radically, early/

D I A G N O S I S.

Before entering upon this important branch of the subject, I would wish to point out that the profession as a whole is severely handicapped in many cases by the late arrival of the sufferer at its door. Either from ignorance or from stoic endurance, valuable weeks and months are lost. Granted this be the case, there are on the other hand, many who, at the first symptom, call in their doctor, and it is to this class that I now refer. It is this group, which, if dealt with in a practical manner might give excellent results, and, in a measure, lessen the terrors of gastric cancer. The chances of early diagnosis too, and of early treatment will assuredly become brighter when that great body of subjects, who, hitherto, have been looked upon as suffering from chronic ulcer merely, are looked upon as the possessors of potential carcinomata. With our modern surgery daily improving, it must surely be the dream of every medical man, and the hope of every human being, that gastric cancer as well as cancer generally will some day be mastered. For in its early stages, it is a local disease, and, while, it may be, nothing can be done medically, early/

early excision is always possible.

Early diagnosis is the one great point which, if we are ever to obtain the mastery over this dire scourge, is essential. Too long has the disease been looked upon as hopeless - it is not hopeless. Only is it so, when such a picture is presented as that, alas, too often drawn in text-books of the patient suffering from gastric cancer. Thanks to modern surgery and to a faint glimmer of improvement in the attitude of the modern practitioner with regard to the diagnosis of the disease, the hitherto existing lamentable state of affairs is fast vanishing and patients, who, some years ago, would have died a painful death, are now in some instances cured, in many relieved for a longer or shorter period and death, when it does come is painless and preceded by comparative comfort.

The literature on the subject is rapidly accumulating. Surgeons both in this country and abroad have given their views, and one and all have shewn that the disease is curable in most cases so long as it is recognised at a sufficiently early stage. Physicians also have expressed their views and shewn the necessity for surgical intervention, but they still seem to hesitate to resort to it until/

until the disease is clearly manifest. If one thing be certain, it is this, that at present there is no medicinal agent which can cure cancer; and we know, further, that in many cases early surgical intervention - in almost any variety of carcinoma and in almost any site - holds out a possibility of cure. It follows then that he who fails to employ those means at his disposal for the cure or relief of his fellow men, is blameworthy. And again, if there exist in the mind of a medical man a suspicion that one of his patients may be the subject of gastric cancer, that patient is fortunate if he has fallen into the hands of one who, doubtful of his case and realising his responsibility, seeks further advice by consulting with a fellow practitioner, or, perhaps better, by submitting his patient to the care of a competent surgeon. In spite, however, of the numerous articles which have appeared and of special treatises upon the subject, the profession as a whole, seem slow to move. During the last five years the subject has been gone into carefully by many investigators; elaborate chemical processes have been executed; special instruments have been invented, and electrical apparatus has been employed, all with/

with a view to the solving of the great problem - how is cancer of the stomach in its early stages to be recognised? But one is tempted to ask, how is the ordinary busy general practitioner to find time to carry out these elaborate investigations? I think it will be generally admitted that practically all of the cases come, in the initial stage, under the care of the general practitioner, and when, finally, the patients reach the wards of a large hospital and careful histories are taken, their early treatment is revealed. The ultimate result in every case of gastric cancer lies with the person first consulted. That a carefully trained practitioner can presume to offer an opinion or advice as to a gastric condition without removing the clothes of his patient is almost incredible. That, granted the clothes have been removed, a practitioner can, after all that has been written, rest content with a single examination, is to be deplored. That the weight of a patient over 40 years of age, who begins to complain of gastric symptoms for the first time in his life, is not carefully registered for one or two weeks, is to court disaster. These perfunctory examinations and this neglect to weigh - to mention only two - are points which perhaps seem incredible, but/

but none the less they are true to fact. The subject of carcinoma arising upon a previous ulcer, too, has not yet received its due measure of attention. Of what use are elaborate tests here? A simple test-meal cannot be given and the resulting contents examined. And finally, a tumour having perhaps been discovered, that precious weeks should be spent in considering whether the mass be gastric intestinal, (foecal), omental, pancreatic, renal, splenic, hepatic or glandular in origin is amazing. There is no doubt that the vast majority of men in general practice are hopelessly behind the times with regard to this question of diagnosis. They continue to treat medically until it is too late surgically - herein is the "fons et origo" of the present condition of things.

I cannot do better than cull from various authors the most common-sense attitude to adopt with regard to this subject:-

In 115 of Osler's cases " a tumor existed, and with this the recognition is rarely in doubt." As Osler says "practically the chief difficulty is in those cases which present gastric symptoms or anaemia, or both, without the presence of tumor/

tumor. In the one a chronic gastritis is suspected; in the other a primary anaemia. In chronic gastritis the history of long-standing dyspepsia, the absence of cachexia, the absence of lactic acid in the test meal, and the less striking blood changes are the important points for consideration. The cases with grave anaemia without tumor offer the greatest difficulty. The blood count is rarely so low as in pernicious anaemia, a point on which F.P. Henry has laid special stress. In only 3 of our 59 cases with careful blood examination was the number below 2,000,000 per cubic millimetre. The lower color index, as in secondary anaemia, the absence of megaloblasts, and a leucocytosis speak for cancer. Some lay stress on the differential count of the leucocytes, but there is not evidence enough to enable us to speak positively on this point. The digestion-leucocytosis might be a help in some cases. The chemical findings are of greater value. The constant presence of lactic acid and the absence of HCl have in several of our cases suggested the diagnosis of cancer, which has been verified later on by the development of a tumor.

From/

From ulcer of the stomach malignant disease is, as a rule, readily recognised. The ulcus carcinomatosum usually presents a well-marked history of ulcer for years. Hemmeter has given a good account of this rare condition in his recent work on the stomach. The greatest difficulty is offered when there is ulcer with tumor due to cicatricial contraction about the pylorus. In 3 such cases we mistook the mass for cancer and even at operation it may (as in one of them) be impossible to say whether a neoplasm is present. The persistent hyperchlorhydria is the most important single feature of ulcer, and, taken with the gastralgic attacks and the haemorrhage, rarely leave doubt as to the condition.

Nowadays, when exploratory laparotomy may be advised with such safety, the surgeon often makes the diagnosis.

The practitioner should recognise the fact that there are cases of cancer of the stomach in which a positive diagnosis can not be reached for weeks or months by any known means at our command."

Taylor says that "Cancer is usually distinguished from the majority of the diseases of the stomach by the presence of a tumour. This is/

is, however, not generally felt in the earliest stages, and may be imperceptible later from its small size; from the pylorus lying under the liver; from its being concealed by much distension of the bowels, or by ascites; or finally, because the tumour is situate on the posterior wall of the stomach. If no tumour is discoverable cancer may be confounded with chronic gastritis, or ulcer of the stomach; or purely neuralgic pains may be thought to be due to cancer. In gastritis the disease may have originated in imprudent diet; the pain and vomiting are more or less intimately related to diet; the appetite is often good, or even excessive; the tongue is furred, and headache, malaise, etc., are present. Cancer, on the other hand, arises independently of previous gastric troubles, and the pain and vomiting are less dependent on food; finally, indeed, the pain becomes continuous. The tongue may remain clean, but appetite is soon lost, and the nutrition of the patient suffers. In gastritis also judicious treatment materially or entirely relieves the symptoms which in cancer are but little, or only/

only for a time, influenced. The same important differences in the result of treatment is to be noted between ulcer and cancer; ulcer is nearly always improved by proper dietetic treatment, whereas cancer may be scarcely at all relieved. Ulcer also has more localised pain, and the pain and vomiting are aggravated or brought on by food. Profuse hæmorrhage is much more probably the result of ulcer, and often occurs early; in cancer it appears late, if at all; coffee-ground vomit is seen in both. Free hydrochloric acid is rarely present in the vomit in cancer. Anaemia is mostly the result of hæmorrhage in ulcer, but in cancer it develops when the bleeding has been slight or absent. A cicatrised ulcer may lead to troublesome pains, but there is the long history, and the strength and health are fairly maintained. Dilatation of the stomach occurs very late in ulcer, but much more rapidly in cancer. Exceptionally the tumour of cancer may be simulated by the matting and adhesion of parts caused by ulcer. The age to which cancer is almost strictly limited, and the short duration of the disease, are/

are also important elements in its diagnosis. In purely nervous affections of the stomach the pain is continuous, but there is generally no wasting. Occasionally the anaemia of cancer has been so marked, and the local symptoms so slight, as to have led to the suspicion of pernicious anaemia; this is especially likely where the tumour is small or not easily reached. In such cases repeated examinations of the abdomen must be made. The absence of free hydrochloric acid from the contents of the stomach is not peculiar to cancer, but its presence on repeated examinations is an argument against that disease. Lactic, butyric, and acetic acids are likely to be present from dilatation, and fermentation of the contents."

Hale White states that "gastric carcinoma should always be suspected in any patient who, after the age of 50, becomes chronically dyspeptic for the first time in his life. Many mistakes are made because this rule is forgotten;" and later he says "it may be difficult to distinguish between ulcer and carcinoma of the stomach, but the subjects of ulcer are younger than sufferers/

sufferers from carcinoma. They commonly give a history of previous similar attacks; or at any rate they say that they have before suffered from indigestion; but malignant disease of the stomach often occurs in persons who have never had indigestion. The pain of ulcer is made worse by food, and is relieved by vomiting; in cancer this is less common. Wasting is a less marked symptom in ulcer, and the patients do not so often complain of loss of appetite and repugnance to food. The absence of hydrochloric acid and the presence of lactic acid and sarcinae are strongly in favour of cancer; and the presence of secondary nodules is of course, conclusive. Professor Osler quotes the case of a man in whom a small nodule in the anterior abdominal wall was associated with gastric symptoms of uncertain origin. It was excised, found to be carcinoma, and the diagnosis of gastric carcinoma thus arrived at proved to be correct. Profuse haemorrhage and bright redness of the blood are in favour of ulcer, and the patients affected with this malady rarely have the appearance of those suffering from cancer. Lastly, a duration of more than eighteen months is much in favour of/

of ulcer. The most difficult cases are those in which an ulcer has by its adhesions formed a tumour in the region of the pylorus, and the difficulty is enhanced if this also leads to dilatation of the stomach, and I have known induration about the gall-bladder induced by gall-stones implicate the pylorus, and by causing a tumour and gastric dilatation, lead to a diagnosis of cancer of the stomach.

In the early stages" [and this is where the diagnosis must be made] "the diagnosis between cancer and chronic catarrhal gastritis is often impossible; but, as already remarked, when symptoms of indigestion come on for the first time after the age of fifty they are nearly always due to cancer; but under thirty hardly ever. After what has been said about carcinoma, the reader will easily be able to perceive the signs which, in a later stage of cancerous disease, will prevent a mistake.

From a practical point of view it is often a difficult question whether a patient who is obviously ill and anaemic is suffering from pulmonary tuberculosis, pernicious anaemia or from a latent carcinoma of the stomach. No useful purpose will be served by going over the points of diagnosis for each/

each case must be judged on its own evidence. The best way to avoid a mistake is to remember the possibility of it. Great care may be necessary to determine whether a tumour in the abdomen springs from the stomach or not. If it is in the pyloric region, it may be attributed to the liver or gall-bladder; or it may be that from stretching of the attachment of the stomach it is mistaken for a movable kidney. The pylorus may in such cases be felt as a tumour below the umbilicus and may be moved three or four inches with the hand. An excellent case in point is figured by Professor Osler. Great attention must be paid to all the symptoms of the individual case. If the stomach be dilated, or gas can be felt on pressure to bubble through the tumour, it is in the pylorus. Growths in the body of the stomach often form a hard solid mass running transversely across the abdomen, so that they are very difficult to tell from the edge of the liver, a thickened puckered omentum, a tumour of the colon, or a faecal accumulation. In such cases it is of the greatest possible importance to observe the precise position of the tumour, its extent, and its relation to the edge of the liver/

liver; and to distinguish the gastric resonance from that due to the colon. Inflation of the stomach may help us much; and it is often wise, not to give too positive an opinion until the bowels have been well opened by an enema. In rare cases it has been difficult to distinguish between an enlarged spleen and a tumour at the cardiac end of the stomach. If a patient be made to swallow two or more drachms of bismuth carbonate in a little milk or mucilage while he sits in a chair, the metal may be seen with the x-rays to fall to the lowest part of the stomach, and thus we learn whether it is dilated. In many cases no tumour can be felt during life, and the organ is not dilated, but even then a diagnosis may often be made by the other signs. The most difficult cases are those in which extensive secondary growths in other organs divert attention from the stomach; indeed, sometimes there are no gastric symptoms, and although it may be recognised that the growths we discovered are secondary, we have no clue as to the primary focus."

Herschell has dealt with the subject very exhaustively. In his preface are set forth clearly the views which I have expressed in my introductory remarks/

remarks and, though Herschell's book was published in 1907 and though he states that his "remarks will be chiefly addressed to those engaged in general practice, as it is by these gentlemen that the discovery of cancer of the stomach must be made, if the diagnosis is to be made sufficiently early to be of benefit to the patient," still there does not appear to be any great improvement in the direction he points out. If every practitioner would carefully study Herschell's book, perhaps such an improvement might be looked for. For in those compact 83 pages are set forth golden truths, and it is a pity that the work has not a wider reputation. It is true that there are descriptions of clinical research methods which, as I have before mentioned, it is difficult to imagine the ordinary general practitioner studying far less putting into execution.

He says "it is a fact to be regretted that the unfortunate patient suffering from cancer of the stomach is usually treated for indigestion, dyspepsia or for catarrh of the stomach until long after the stage when a radical means of cure could be employed with any probability of success," and that "the object and aim of this paper is to discuss briefly the diagnosis of cancer of the stomach before it has advanced so far as to be unmistakable/

unmistakable, when there is yet probably no tumour to be made out by the ordinary methods of examination, and when the cachexia and anaemia are not yet so marked as to point to the presence of a serious affection."

- He describes the "Symptoms of Commencing Cancer of the Stomach" and gives a translation of an excellent description by Bouveret of the ordinary onset of the disease. He divides the cases into: -
- (A) Cases in which there are at first no Gastric Symptoms.
 - (B) Cases which from the first show Distinct Symptoms referred to the Digestive organs.
 - (C) Latent cases with no Symptoms of any kind until shortly before death.
 - (D) Cases marked by Progressive Emaciation and Wasting as the Earliest Symptom..
 - (E) Cases in which the earliest symptom is Anaemia.
 - (F) Cases where the Loss of Appetite in conjunction with Emaciation are the first Troubles noticed by the Patient.
 - (G) Cases marked by a Sensation of Sinking at the Pit of the Stomach.
 - (H) Cases presenting the Symptoms common to the different forms of Chronic Indigestion.
 - (I) Cases marked by nausea and vomiting in the absence/

absence of Pyloric Obstruction.

(J) Cases where Pain is a Prominent Symptom.

He discusses the Examination of the Blood.
I have referred to this under Anaemia (page 91).

He refers to the Gastric Juice (also referred to page 138); examination of portions of Gastric Mucosa - a process suggested by Einhorn and Hemmeter, and the latter's curettage - examination of the abdomen for tumours by (a) Palpation and (b) by means of the x-rays.

The "Summary of Conclusions Arrived at" would, I think, alone be of the greatest assistance to medical men. Their value is unquestionable though perhaps bacteriological and chemical investigations are described in such fulness as to impair the value of his work so far as the busy practitioner is concerned.

Later he deals with "Clinical Problems Connected With The Later Stages of Cancer of the Stomach." Under this subject he discusses the "Proof of the presence of ulceration in the Stomach." Here he mentions "occult blood in the stools and stomach contents." He gives "Salomon's test for Ulceration". Dealing with "Signs that an ulcer of the stomach is malignant, he mentions 'Microscopical examination of the Fasting/

Fasting Stomach', 'Occult Blood in the Stomach contents or stools'." He refers to "Serum diagnosis by the method of precipitations." There follows under "Signs occurring in the Course of an Ordinary Ulcer of the Stomach which Point to the Fact that it is becoming Malignant," "the presence of the Oppler Boas bacillus in the interior of blood clots," and "Gluzinski's test" (whether ulcer be carcinomatous). There are two pages on the "Differential Diagnosis of Tumours of the Stomach Region," five pages on the "localisation of Cancer of the Stomach." Under the latter he describes "Cancer of the Cardiac orifice", "Mural or interostial Cancer" and "Cancer of the Pylorus." He gives a table dealing with the "Differential Diagnosis between Cancer of the Stomach, and the Severer forms of Chronic Gastritis;" and finally under "Some Diagnostic Points in the later stages of Cancer" refers to "Alteration in the Cardiac dulness", "Glandular Enlargement" and "Metastasis to the ovary."

Herschell concludes his admirable book as follows - and here his remarks can be followed and obeyed by any one - "It being admitted that only an early diagnosis is of any value to the patient or/

or satisfaction to the physician, any of the following conditions should warrant a careful course of investigation in which all diagnostic means are exhausted.

1. All cases of stomach affection in men fifty or sixty years of age, which do not react to ordinary treatment. This is all the more imperative if the patient has not previously suffered with his stomach.
2. All cases of supposed acute dyspepsia in persons of middle age which are ushered in by either haematemesis or by melaena.
3. All cases of progressive loss of appetite or aversion to meat.
4. All cases of dyspepsia which are accompanied by loss of flesh, progressive weakness or anaemia in persons of middle age.

Any of these cases may be cancer of the stomach.

Taking into consideration the importance of the issues at stake, few intelligent persons will grudge the comparatively short time required for the proper study of their case.

With such an examination it may be possible to/

to recognise the disease sufficiently early to save the patient's life. Without it, the time for effective treatment will pass by, for when the disease shall have advanced so far as to be unmistakable, it will have reached a stage in which nothing but palliative measures can be adopted."

He advises the removal of the patient to a nursing-home, so that careful examinations can be made of the urine, stools and stomach contents. Here he would seem, however, to forget that the great bulk of patients with gastric cancer are, I think it will be granted in the lower classes where such a proceeding is out of the question.

A point on which he lays great stress is that it is impossible to give an opinion as to a gastric case by a single examination in a consulting-room, and he admits that "the recognition of malignant disease of the stomach in the very earliest stage is a matter of great difficulty."

(32)

Comrie reviewing recent medical literature dealing specially with recent gastric tests refers to a comparison of Salomon's and the Haemolysin Test. He says "Fraenkel instituted an interesting comparison to discover the relative merits of Salomon's test/

test and the haemolysin test as regards early diagnosis in cancer of the stomach. The former, . . . is a procedure introduced by Salomon in 1903, and consists in the examination of the wash-water from the fasting stomach for albumin and amount of nitrogen An amount of albumin over $\frac{1}{16}$ per thousand and of nitrogen exceeding 20 mgms. is supposed to indicate strongly the presence of carcinoma. In practically all cases of gastric carcinoma there are set free in the stomach, as pointed out by Grafe and Rönner, various bodies of a lipoid nature possessed of a haemolytic action." The tests are intricate and have been upheld and cast aside by various investigators. Sisto and Jona, according to Comrie, uphold the haemolysin test whilst Livierato opposes it, and Fraenkel seems to think there are fallacies with either, but that they are useful. Comrie continues "Somewhat similar results were reached by Rose, who regards both tests as of considerable value, and we may conclude that in doubtful cases of carcinoma where it is important to come to a definite decision for the purpose of operation they form useful additions to our diagnostic armamentarium/

armamentarium, though they must not be viewed in the light of being infallible in either direction."

Comrie then mentions the Tryptophan test for carcinoma which was introduced by Neubrauer and Fischer in 1909. "Since then" he says, "It has been subjected to considerable criticism and review, notably of late by Oppenheimer. The test depends upon the fact that the surface of a breaking-down carcinoma secretes ferments capable of splitting up proteids." Oppenheimer and Weinstein speak favourably of it. Like all such tests, there are fallacies connected with it and Comrie concludes by saying "like the other two tests discussed above, the tryptophan test may therefore prove valuable in cases where there is little to go upon in making a diagnosis, but one must not trust to it entirely."

The test is further described and results given in "The Therapist" (33) for September 15th, 1910, where notes on a series of 21 cases are given by Lyle and Kober from the Research Laboratory of the Roosevelt Hospital. The test, it is said, "depends upon the fact that digestion proceeds further in a carcinomatous stomach than in a normal one, due to the presence of an enzyme from the carcinoma/

carcinoma, which is analogous to trypsin in its action. As is well-known, pepsin can only digest proteids to albumoses and peptones, while trypsin is able to split them to amino and diamino acids. They use an amino acid, tryptophan, which, in peptide combination as glycyl tryptophan, cannot be digested by pepsin and does not give a colour reaction with bromine, but when the tryptophan is split up by tryptic ferments (carcinoma) a reddish violet colour results when bromine vapour is added." A few fallacies, however, are described. The article concludes - "We would say that our results with this test have been satisfactory. A repeated negative reaction is very valuable No deduction ought to be drawn from less than three tests."

Carter (34) referring to the diminution of the superficial Cardiac dulness in cancer, pointed out by Gordon, gives the latter's conclusions. It seems to be seldom absent in the later stages.

Boardman Reed in Lecture 4, in his book already quoted from, writing of the importance of the obtaining of a full history says "it is always advisable, when practicable, to obtain from patients detailed accounts of their past and present/

present symptoms, with the chief facts in the family history. Indeed, this is often a very necessary preliminary, if you are to make such an examination as shall lead you to a correct diagnosis in any very obscure or chronic case of ill-health. . . . Naturally the exigencies of a large practice will render it impracticable to examine minutely every part of every patient's body, to say nothing of analyses of the secretions and excretions and thorough examinations of the blood. But whenever a patient has long complained of symptoms which, being only temporarily relieved by remedies, point to some chronic lesion or derangement in any part of the system, it is necessary to make a full and careful inquiry into his condition and antecedents. . . . The less dexterous and expert a physician is in the technical arts which are indispensable to a good diagnostician and the more deficient his training in, or facilities for, thorough laboratory work, the greater the help he may derive from an unusually full and minute account of the history and symptomatology of any case. . . . Besides the name, age, residence and occupation, ask the present weight of the patient, the best former weight, and how long/

long a time the loss or gain has been going on. Inquire as to the health of the parents, or, if dead, the age and cause; also as to the health of brothers and sisters."

Discussing the symptomatology he says "Cancer of the stomach usually begins with the symptoms of chronic gastric catarrh, mildly and often very insidiously. It is quite impossible to make the diagnosis at first. When, however, a person of middle age or beyond, who has not previously suffered from indigestion, begins, without any particular fault in diet, to complain of slight discomfort after eating, with gaseous eructations, falling off in appetite, especially for meats and fats, and loss of strength, these symptoms persisting and becoming gradually and often rapidly worse, in spite of appropriate treatment, you may suspect carcinoma." He then mentions HCl, melaena, haematemesis, and severe pain, and adds "if lactic acid should be found . . . , with or without the Boas-Oppler bacilli, there would be sufficient cause for venturing the diagnosis of probable cancer, and advising an exploratory incision, even before a tumour could be recognised." Writing of the Diagnosis, he says "there should be no difficulty in recognising a typical cancer of the/

the stomach, when the tumor is palpable." He mentions "the unevenness of the growth, its mobility, as a rule, and its association with . . . pain . . . cachexia, anorexia, and vomiting . . . the muscular tissues being lost faster than the fatty - just the contrary from what happens in tuberculosis."

"But" he continues, "in these days when surgery can sometimes, under proper conditions, perform what would have seemed miracles to a former generation, it is exceedingly important to make the diagnosis of gastric carcinoma at the earliest possible moment and before a tumor can be made out. Often when a tumor is palpable the time for operation has already gone by."

It is your duty to make, or have made for you, a probable diagnosis in such cases at a time when, if, after an exploratory incision, cancer be found, an operation can be done with the reasonable hope of at least considerably prolonging life But, to accomplish this, family physicians must make themselves masters of the recent stomach lore, or at least learn to recognise promptly the earliest suspicious symptoms, and then have thorough examinations made To avoid/

avoid letting precious time pass by when something hopeful can be done for carcinomatous patients, you should consider the possibility of cancer or some other important lesion in the case of every patient whose dyspepsia, especially if recently acquired, does not within a week or two show improvement after a proper regulation of the diet and hygiene generally, and a trial of simple remedies."

Gordon (5) to whose paper I have before referred, cites as an example of Commonness as a factor in diagnosis, the following two cases:-

1. "A man of about 60 had a movable intra-abdominal tumour to the right of the umbilicus, and was thought to be suffering from a growth in the omentum. But between 55 and 65 cancer of the pylorus is immensely commoner than any growth in the omentum, and cancer of the pylorus was what the tumour turned out to be.
2. A man over 70 had a firm nodular lump midway between the umbilicus and the xiphoid cartilage. It could be shown to be pyloric by flicking the abdominal wall in the left hypochondrium, when a swelling rose up, corresponding in shape and position to the stomach, with waves of peristalsis travelling over it from left to right and ending in the lump. When the stomach was inflated this swelling/

swelling and its relations to the lump became even more conspicuous. Yet it was afterwards supposed that this was a cancer of the colon, and an operation was recommended.

Under chloroform, however, it was found to be a cancer of the pylorus, and the operation was abandoned. At 70 the utmost care should have been taken before setting aside the former diagnosis, since, in men between 65 and 75, cancer of the pylorus is probably thirty times commoner than cancer of the transverse colon."

He says later "The most important cancers in which relative commonness may be fairly considered a factor in the diagnosis, are those of the stomach . . . The sex incidence of these" he continues "is worth bearing in mind," stating that cancer of the stomach is practically as common in men as in women. "At different ages" he says

"the relative commonness of the cancer of different organs also varies remarkably" and he adds that over 25, cancer of the stomach in both sexes becomes one of the most frequent. He concludes his paper thus "We must hope that the day is approaching when the diagnosis of internal cancers will be so much more precise that probabilities will cease to serve us. But until that happy moment arrives we/

we make, I would submit, a serious error in overlooking the help which a study of these probabilities holds out."

Sherren, before referred to, says at the outset of his paper "there is no disease amenable to surgical treatment for which so much could be done by the practitioner as for carcinoma of the stomach, not only in its early recognition, but in its prevention. General practitioners see the disease early, often in its precancerous stage. I, with rare exception, see it only in its more advanced stages, when diagnosis is certain and the result of treatment problematical. For example, among the 70 cases I have operated on, only in 17 was I able to do the modern operation of partial gastrectomy, and none of these could be called 'early cases' . . . I do not propose to discuss at any length tests of the gastric contents which are almost impossible of execution by a man in active practice. I wish simply to draw attention to the early symptoms suspicious of carcinoma, the means at our command of proving or disproving their correctness, and to the possibility of preventing the onset of malignant/

malignant growth in the stomach Carcinoma of the stomach in the majority of cases produces symptoms early, but they are usually vague, and those which are supposed to be typical of carcinoma only reveal themselves at a late stage of the disease. This is a most important point to remember in dealing with these cases. . . . I think we shall not be far wrong in saying that in 35 per cent of the cases, symptoms are present pointing to the stomach as the seat of the disease."

Later he points out that it is in cases "following previous gastric disease" where "prevention" should occur, and that in cases "in which carcinoma occurs in individuals with a clean gastric history, that early recognition is so urgently called for."

"The first symptom" of the latter class, he continues, "is usually epigastric pain or discomfort, called 'indigestion' coming on in the midst of perfect health. Of insidious onset, the discomfort becomes pain, which may be a constant gnawing made worse by food, often keeping the patient awake at night, and not so often relieved when the stomach is empty as is the pain and discomfort of chronic ulcer. There may be no other symptoms.

As time goes on the disease reveals itself by the gradual development of what are considered to be the symptoms of gastric carcinoma. The patient develops a distaste for food, particularly for meat, vomiting of coffee ground material commences, a tumour develops, and changes are noted in the gastric contents after a test meal, signs that the disease has advanced too far for the most effectual surgical treatment

At the present time it is perfectly safe to say that all the positive signs of carcinoma of the stomach are late signs, and that any one of them (with the exception of the secondary deposits) may be found in cases of simple gastric disease, or even in disease of other abdominal viscera . . .

At the present time" he continues, "there is no certain early sign of gastric carcinoma. How, then, is it to be recognised early? This can only be done by treating seriously any digestive disturbance arising in adults; the surest early sign we possess is given by the failure of medical treatment. If dyspepsia arises in an adult previously in good health a careful examination is made for signs of organic disease of the stomach tumours/

tumours, dilatation, etc.. After treatment of all bad teeth, the patient should be given a few day's rest in bed. This is often sufficient to cure, but if symptoms persist or recur after all causes, such as overwork and bad habits, have been corrected, surgical intervention should be the rule after analysis of gastric contents. It is only in this way that we can hope to treat carcinoma of the stomach early.

If signs of organic disease of the stomach are present on the first examination, the patient should be advised to submit to surgical treatment.

My contention is that any previously healthy adult who without obvious reason, bad habits, overwork, etc., commences to suffer from epigastric discomfort, should be looked upon as possibly suffering from carcinoma. We need to educate the public to understand that dyspepsia at this time of life should not be regarded lightly and cannot be efficiently treated without rest, often rest in bed. . . .

I do not wish it to be understood that I advocate surgical exploration in every case of dyspepsia; far from it. I simply contend that cases/

cases of dyspepsia in adults which do not yield to rest in bed and diet, after removal of carious teeth and correction of bad habits, are usually due to organic disease, amenable only to operative treatment, and at a certain period of life are suspicious of carcinoma."

He states that the gastroscope in its present form is probably more dangerous than exploratory laparotomy in the hands of a competent surgeon.

He continues, "I have also omitted all mention of the presence of a tumour as a symptom, as this is a late sign. Early and certain recognition of carcinoma of the stomach is only possible by surgical exploration after the failure of medical means of cure."

He cites the case of a woman of 32, in whom carcinoma developed after thirteen years' medical treatment for gastric ulcer, and after advising careful medical treatment in every case for a little, says "if rest fails to relieve, or symptoms recur on resuming work, surgical treatment should be adopted."

Paterson (35) says, "a palpable tumour is not an early sign of cancer. Our aim should be to/

to establish a diagnosis, or at least the necessity for surgical treatment, before a tumour can be felt." He advises the distending of the stomach with air, preliminary to abdominal examination, and says that a hardening thus felt in the region of the pylorus indicates the necessity for surgical treatment. In his opinion, an analysis of the gastric contents, interpreted in connexion with the clinical history, is of the greatest help. . . .

. . . . "a marked diminution of the protein hydrochloric acid is, in my opinion, a very early symptom of gastric cancer."

present "I am convinced that a good many cases are overlooked because under dieting and rest the patient improves temporarily and puts on weight. It is not uncommon in hospital notes to find a record such as this:- 'The patient was admitted for supposed cancer of the stomach, but under medical treatment gained in weight and was discharged much improved.' Not infrequently such improvement is but temporary, and later the patient again comes under observation, with obviously inoperable gastric cancer. I have observed a patient with cancer of the stomach put on/

on as much as 4 lbs. in ten days. Such improvement, of course, occurs only in early cases, before the disease has spread beyond the limits of the pylorus - just those cases, in other words, which would be most benefited by operation. I wish, therefore, to lay particular emphasis on this point - namely, that gain in weight and temporary improvement under medical treatment and rest in bed is no contraindication to cancer of the stomach.

Fortunately, it is not necessary to make a definite diagnosis of cancer in every case. All we need do is to ascertain that a condition is present which requires surgical treatment, and this I maintain is quite possible with the means at our disposal. I am as averse as any one from making exploratory operations for diagnosis, at the same time, I think the really reckless man is not he who explores after carefully considering the clinical history and results of gastric analysis, but he who adopts the policy of 'wait and see', until the possibility of performing a radical operation is gone for ever. When once we are satisfied as to the probability of cancer, the/

the risk of abdominal operation is less than the risk of delay. At the present time, most cases are not seen by the surgeon until the disease is fairly advancedmost patients with gastric cancer are in poor condition for any operation."

Barling (36), writing of the early recognition of the disease, states that "in that direction is our great hope for the future. The responsibility for delay falls partly upon us as a profession - we are not penetrated by the firm belief, the certain knowledge, that cancer is curable by operation, and that the early and not the later stages of the disease provide the great opportunity. We fail to urge special methods of investigation by instruments of precision, by radiography, by exploratory incision, or even by prophylactic excision. The responsibility for delay is, however, only partly ours. The public, in dread of a diagnosis of disease for which they still think there is no real remedy, often conceal their fears and their disease until what they dread has come about - a stage of malignant growth almost or quite hopeless of cure."

Mansell/

Mansell Moullin (21), in a lecture (1910), already quoted from, said at the outset.

"the subject of the early diagnosis of cancer of the stomach immediately occurred to me as one of the most pressing questions of the day.To be of any use the diagnosis must be early, definite, and capable of being acted upon at once. There is no difficulty when the supra-clavicular glands are enlarged, so that they can be felt, and when the patient is anaemic and has lost a stone or more in weight; but then it is useless. The diagnosis must be made from local signs and symptoms, while the disease is still local, or it is no use making it. The ordinary test, one that is usually appealed to before a surgeon is allowed to see the patient, is the failure of a plan of treatment that has given a certain degree of relief when tried before. Nothing could well be more unsatisfactory or more injurious than this. The treatment has never cured the patient. At the best, it has only relieved the symptoms, and that for a time. Now they have returned again, rather more marked than they were before, in a patient who has grown older./

older, nearer the age when carcinoma is most common, and who is scarcely so well-nourished as he used to be; all excellent reasons for not trying the same line of treatment again. It is thoroughly illogical to do so; but men are so curiously optimistic in these days, being inclined to see only the things they wish to see, and patients, who know nothing whatever about the question, are naturally so disposed to try anything and everything before agreeing to an operation, that the trial is made; the same line of action followed out again; an immense amount of the most precious time lost, and the diagnosis never made until all chance of curing the patient is long since past and gone. It is a cardinal rule in surgery that diagnosis, whether the case is one of carcinoma of the stomach or not, should precede treatment and not follow it. It is a confession of ignorance to look upon treatment as an aid and help to diagnosis, and no case of cancer of the stomach will ever be cured if the patient has to wait for an operation until after the trial and failure of every line of treatment that is recommended, because once, when the disease was of a totally different character, it gave a certain/

certain measure of relief."

Hort (37), after pointing out that the diagnosis of malignant disease is attended by many difficulties, shows that "in three years the total number of cases, at all ages, of disease proved to be malignant, occurring in the practice of thirteen of the leading London hospitals, was 3,532, including cases in which recurrence had taken place. Of this number, 582 had not been diagnosed clinically. In addition, 220 cases had been wrongly accused of suffering from malignant disease." He wishes to bring out "the value of the antitryptic index in the diagnosis of malignant disease," and says "a raised antitryptic content appears to be often of the greatest value in distinguishing between an innocent neoplasm and a malignant. Its chief value appears to be in distinguishing, for example, . . . simple gastric ulcer from carcinoma of the stomach, and the complication of the former by the appearance of the latter." Roux and Savignac agree most strongly with him.

Hale White (22), in the paper I have before referred to, says, "in all cases of gastric carcinoma/

carcinoma the uttermost endeavour must be made to diagnose carcinoma of the stomach before the growth becomes tangible, for usually by such a time the period during which the growth could be excised has passed. It is, I think, clear that there are no means of infallibly diagnosing cancer of the stomach in its early stages; but I do believe that by carefully considering a number of points we might sometimes arrive at a diagnosis earlier than we do, and therefore give the patient the chance of excision, for medicines are powerless to cure him."

Moynihan (22) (before referred to), after pointing out that gastric cancer claims 1500 victims every year in England, says "it is only by the close association of the physician and the surgeon, and by their united endeavours, that any hope of improvement in this lamentable state of affairs can be entertained. The opinions which I am about to express will probably not meet with the approval of all, may perhaps encounter the strong opposition of some, but they are views which I have been brought by degrees to hold firmly, and I am here to speak of the faith that is in me The position seems now to be this - that/

that there are no signs or symptoms clearly indicative of the presence of gastric cancer; there is no refinement of clinical inquiry nor any endowment of clinical acumen which will enable a confident diagnosis to be made in an early stage; inspection of the stomach during an operation carried out when definite faults in its working are known will permit of the early discovery, or of the prevention of a certain proportion of the cases of cancer. The surgeon must not ask the physician for a sign which will reveal the presence of this disease to him, but he can and should require that those conditions which are only to be remedied by operative measures should be referred to him not in their advanced or terminal stages, but at the earliest moment of their recognition. The success which has followed the surgical treatment of gastric disorders justifies this simple request."

When is Saundby (38) writing of diagnosis in Stomach Surgery, after giving a case, in which stomach trouble had existed for twenty years and in which a medical practitioner, a physician and a surgeon could not agree, says - "The difficulties/

difficulties in the way of intelligent management of stomach cases are great." Mansell Moullin (24), in his 1906 clinical lecture to which I have before referred, says "The subject to which I wish to draw your attention to-day only a few years ago was considered to be entirely outside the province of surgery. Many of our medical colleagues appear to think that it is so still. Yet it is absolutely beyond contradiction that the only proceeding known at the present day which holds out the least hope of curing a patient suffering from this complaint is a surgical operation. Medicine does not offer the slightest, and does not pretend to; it merely treats the symptoms and lets the disease alone. And I have no hesitation in expressing my conviction that the time is not far distant when the public, who are much better informed as to the progress of surgery and surgical treatment than is usually believed, will insist on a surgical consultation being held at the earliest opportunity in every case in which there is the least suspicion of the existence of this complaint. One of our greatest living authorities on diseases of the stomach, the other day went so far/

far as to say that the repugnance of the patient to operative measures is very often merely the outcome of the repugnance and lack of initiative in the physician. . . . Laboratory findings, as we know them at the present day, are of very little use in the early stages of such a disease as this. . . . You must make up your mind first from the clinical data which you can learn at the patient's bedside . . . "

Tests are only for confirmation he contends.

"If the experiments confirm your suspicions, well and good. If they do not you must have the courage of your convictions and make up your mind that if one or two week's treatment does not effect a distinct improvement you will proceed to the other method which I mentioned - direct palpation through an incision. If there are really rebellious anorexia and more or less continuous pain I should certainly not wait longer.

I have the strongest possible objection to what I have sometimes spoken of to you as roving commissions inside the abdomen, and I have consistently declined to adopt such a proceeding. But when there is definite evidence that one particular organ is not doing its work as it should do; when there is no reason to be found why/

why it does not; and when it is clear that the patient's health is beginning to suffer, the circumstances are absolutely different. Exploration is no longer a roving commission. It is part of a definitely thought-out plan to clear up the reasonable suspicion of the existence of a disease which must be dealt with at once if at all, and which if left will inevitably prove fatal within no long space of time. . . . Let me conclude with a remark from one who is a recognised authority - Hemmeter: 'The simple continuance of a chronic gastritis, or nervous dyspepsia in spite of logical and scientific treatment, accompanied with progressive loss of body weight during three or four weeks, justifies the suspicion of latent gastric carcinoma.' If you suspect the existence of cancer you must not wait."

With/

With these quotations before me, any words of mine would be superfluous - I can only agree with all that these writers have said therein. It has always seemed to me that a surgeon of wide experience has a great advantage over all others, whether general practitioners, physicians or minor surgeons, for he sees the final condition of everything doubtful. The great mysteries presented to the physician in the shape of abdominal tumours are revealed with one small stroke of the knife - and during my short experience of surgical work, I was fortunate enough to have no small number of such cases. But I cannot say that in any case was a gastric carcinoma revealed where one already did not expect to find it: per contra in one case diagnosed as gastric carcinoma, operation revealed that it was not.

In my series of cases, I have noted several points which struck me as being of interest with regard to this all important point of diagnosis, especially early diagnosis. These I will now briefly summarise. Firstly, what is the disease most commonly mistaken for? One would naturally assume that other gastric diseases would offer the greatest difficulty/

difficulty in diagnosis. Of these, chronic gastric ulcer, chronic gastritis, gastric neurosis, dilatation ventriculi from pyloric stenosis, etc., would be, perhaps, the most likely to be confused with carcinoma. But such is not invariably the case. In my series, patients were treated, in the absence of tumour, for pleurisy, muscular rack, neurasthenia, anaemia, plumbism, phthisis, tape-worm, early pregnancy and locomotor ataxia. In the two last cases, the vomiting and pain respectively offered 'difficulty'. When one hears that belladonna plasters, poultices, powders, liniments, tonics (blood, nervous, and otherwise), cod liver oil, fresh air and a residence in a sanatorium, change of air, vermifuges, treatment of the vomiting of pregnancy, and antisyphilitic remedies were of no avail, one is not surprised.

In the presence of tumour, patients were treated for "swollen glands," abdominal tuberculosis, enlarged liver, enlarged spleen, floating kidney, and faecal accumulation. Many were allowed to go on for some months notwithstanding the fact that a tumour had been discovered. If such be the case, it is surely/

surely evident that the day when gastric carcinoma in its early stage will be discovered is far off.

Medical men manufacture difficulties. In spite of the fact that many patients had previously exhibited definite symptoms of ulceration, had for some time past been suffering from definite symptoms of ulceration, and had family histories which alone were of the greatest significance, they were not submitted for operation till it was too late. In some cases, valuable time was lost, for, in the belief that the teeth were at fault, (teeth which had probably been at fault for years) these were removed and time given for artificial ones to be procured, which naturally was accompanied by a steady downward progression. Some patients stated that the doctor said he could not make a proper examination as the muscles were so firm.

One, though carefully examined by the doctor, with a negative result, was found to be covered with nodules over the shoulders, axillae, back and buttocks - secondary to a gastric carcinoma. In practically none was the weight enquired into. Many were "sent for a change" and having no one to look after/

after them came back reduced and hopeless from a surgical standpoint. Why a patient should be sent to a sanatorium when no pulmonary lesion was manifest is difficult to explain. The only reasons perhaps were that he was losing weight, and under 30 years of age.

And that a female, because she vomits and has amenorrhoea, should be considered pregnant, is unreasonable. There are, alas! other causes than pregnancy for vomiting, and the amenorrhoea which occurs is the same as that seen in cases of phthisis or any other disease where the general condition of the patient is 'below par'.

If all cases of gastric disorder were treated seriously - that is, were a careful regulation of the diet undertaken, combined with systematic body-weight examination at regular short intervals - no matter at what age it occurs, what the sex be, or what the previous history, I think I could confidently and on good grounds predict a steady improvement with regard to the successful treatment of carcinoma. If weight were not gained in 3 weeks of such treatment, and if suspicions still existed after a careful consideration of the case, I would be inclined to advise/

advise that a surgeon should see the case - and with him ought to be the decision as to operation or no. Certainly, it appears to me a strange and very responsible position that the physician unnecessarily assumes. He takes all the onus for a disease for which he can provide no remedy. As well might surgeons be called upon to treat pneumonia or rheumatism.

And, as showing the almost insuperable difficulties, apparently, attending diagnosis, and as furnishing proof that medical practitioners - perhaps too often slighted - are to be excused in many cases, I would here state that of my series there were some who, at varying intervals, under a year before their ultimate arrival in the surgical had been inmates of the medical wards. From the latter, in spite of their age, family history, previous health etc., in spite of careful investigation, with all the latest tests being employed, and frequent examination by many different persons, they were discharged as improved. Some of them even as cured. Such are the actual facts, two of my own 20 cases illustrated this to the full. Five months before, though over 50 in each case, with a strongly suggestive family history, and/

and with a doubtful tumour in one case, and a dilated stomach with Boas-Oppler bacilli in the other, they had been treated in the medical house. They gained a few pounds and were discharged. With what result? Both were inoperable. Gastro-enterostomy was performed for the relief of vomiting - but that was all. I have no hesitation in saying that those two cases if operated upon on their first arrival would probably have been **really** cured.

The cases I have mentioned are 9 in number. Treatment in the medical wards occurred in: -

1 case, aet. 64,	3 months before.
1 case, aet. 50,	4 months before.
2 cases, aet. 54 and 63,	5 months before.
3 cases, aet. 40, 50 and 70,	6 months before.
2 cases, aet. 37 and 53,	10 months before.

That all these cases were advanced carcinomata within a period ranging from 3 to 10 months after their discharge from the medical wards shews the difficulties we have to contend with. The above are those, too, out of a total of 11 who previously had been/

been treated in the hospital for gastric complaint. The other two cases had been in hospital 3 years before. In them, it is almost certain that carcinoma had arisen on a pre-existing ulcer, on the posterior wall, and on the lesser curvature, several inches from the pylorus. They had been treated for gastric ulcer and duodenal ulcer, and were aged 50 and 56.

I will conclude with a few remarks regarding tumours, and their diagnosis. I think I am not far wrong in saying that 85 per cent of tumours situate above the umbilicus in persons over the age of 45, are gastric in origin. What other origin can they have? The only other organs I would be disposed to suspect would be the liver (gall-bladder) or kidney. In younger persons I have seen an enlarged gall-bladder, a pancreatic cyst, a hydronephrosis, or a retro-peritoneal dermoid give difficulty. I have seen a floating kidney so variable in its position, being sometimes vertical, sometimes transverse, in a thin woman that it was mistaken by two surgeons for a pyloric tumour. I have seen an enlarged spleen diagnosed by a physician as a carcinoma of the body of the stomach, mainly because there were no changes in/

in the blood. I have seen a pyloric carcinoma which lay at the level of the umbilicus diagnosed as a carcinoma of the transverse colon; and finally I have seen a fibro-sarcoma of the rectus abdominis diagnosed as everything but what it was. I have heard of mistaken diagnoses in many cases because the tumour was thought to have an omental origin - in seven years' experience of medical and surgical wards, the latter is the only abdominal tumour I can recall as never having seen an example of.

But I return to the initial stage of the disease. If tumours present difficulties, such are easily solved. The difficulty which all medical men experience is in the early stages - and it is only by careful, serious, and systematic examination of every case which crops up that we shall succeed. That such success will be attained and that these perplexities will gradually disappear is certain, for the subject is every day becoming more and more serious and its increasing gravity is calling forth greater care. I would most strongly emphasise the value I place on careful abdominal palpation, with a warm hand and in a good light. Time is essential; there must/

must be no slipshod examination. In nervous females, the rigidity of the abdominal walls may be overcome by the administration of a whiff or two of chloroform. I am convinced that many cases in women would be discovered earlier were this carried out. The use of chloroform with such an apparently trifling object in view is, I know, deprecated by many, but its opponents are probably they also who have no time to give test meals or to weigh, who, in short, are largely responsible for the late stage at which such cases are seen. With regard to females specially one rule I think might with advantage be given to everyone in leaving his Alma Mater, - it is this, 'Be slow to diagnose Neurasthenia - a gastric cancer may lie hid in such a case.'

TREATMENT/

TREATMENT.

The treatment, and by this I mean the curative treatment, is totally dependent upon early diagnosis. Boardman Reed writing on 'Treatment' under the heading "Early Diagnosis Indispensable" says: -

"Of two well-established truths regarding gastric cancer you may rest assured: (1) That the disease cannot at present be cured by any medicinal means; and (2) that surgery,, will be equally powerless with medicine to effect a cure, except in those cases in which you, with possibly the help of medical experts, shall have succeeded in accomplishing two difficult things. One of these is to make a probable diagnosis of the disease at a very early stage, before the neighboring glands have become involved, or strong adhesions have bound the part occupied by the new growth to adjacent organs, and usually before the tumor itself can be felt, or cachexia has developed. The other is to induce the patient and his family to consent to an exploratory incision before it is too late. You should remember that an exploratory incision involves very little risk, when done after all/

all necessary preparations by a skillful laparotomist in a person who is still well nourished. Another point of some importance to the patient is also to be borne in mind, viz., that while most surgeons are accomplished in many things besides cutting and other operative work, they are not, as a rule, to which there are exceptions, so well qualified to make an early diagnosis of gastric carcinoma as those physicians who, besides having acquired a proper skill and experience in the art of palpation, have also been especially trained in the recent methods of examining the stomach, not only as to its size and position, but also as to its motor and secretory functions. You should all strive to acquire this skill and special training yourselves. Even with the aid of these methods of precision, it will not be possible, always, to make the diagnosis at a time when an operation can offer hope of a radical cure; but it sometimes can, and without them such a consummation is impossible."

Again under the heading "Indications for an Exploratory Incision," he writes: -

"Indeed, whenever a case presents the symptoms of/

of a severe chronic gastric catarrh, including the absence of free hydrochloric acid, and there is at the same time much lactic acid present, a rather persistent pain localized in the stomach, and marked loss of motor power in the organ, as well as weakness and emaciation, and these symptoms not only continue, but get worse, in spite of lavage, appropriate diet, tonics, and digestive aids, not longer than three, or at the most four weeks, should be wasted in expectant treatment. Under these circumstances, the suspicion of carcinoma should be strong enough to warrant summoning the best obtainable laparotomist and re-examining the patient thoroughly under an anaesthetic. This might reveal an incipient tumor not palpable before; also sufficient glandular or other complications already to render any operation inadvisable, or to limit the surgical intervention to some palliative procedure merely. But supposing that, in such a case, under anaesthesia no contra-indications should be found, there would be warrant, according to the best recent authorities, for making an exploratory incision with preparations for some remedial operation/

operation, radical or palliative, if a tumor should be discovered."

Saundby (39) writes: -

"During the last few years, surgery has interfered with brilliant results in the treatment of diseases of the stomach which were regarded only a few years ago as peculiarly the province of the physician; but there is some difference of opinion as to the extent to which this intrusion is justified, and while surgeons complain that certain physicians take up an unfairly hostile and absolutely conservative attitude, physicians retort that the claims of certain surgeons are altogether unjustifiable, and go beyond anything that is warranted by the results which have been attained. In these circumstances, it is highly desirable that the practitioner should have some guide to enable him to give sound advice to his patients. It ought to be fully and frankly admitted that surgery has been able to cure cases of stomach disease previously regarded as incurable, and that it has prolonged many lives even where it has failed to cure; further, that it has rescued many patients from conditions/

conditions of chronic suffering which, if they do not threaten death, render life a burden. It should be recognized that stomach diseases are common ground upon which the physician and surgeon must meet, and that it is the duty of every practitioner who is himself unable to perform the necessary surgical operations, to associate himself with someone who possesses this skill, and to call him into consultation in all cases which present symptoms that can be relieved by surgical interference."

Again he says: -

"The radical treatment of Cancer of the Stomach is undoubtedly surgical, and there is reason to believe that if the diagnosis could be made sufficiently early, the results would be more encouraging than they are. Better results can only be looked for if practitioners will consider the propriety of surgical interference so soon as the presence of carcinoma is suspected. . . . Surgical operation in cases of Cancer of the Stomach has in the past 10-15 years been followed by such remarkable results, that it deserves greater encouragement. It is obvious that only early operations are likely to/

to be successful, and, therefore, it is much to be desired that practitioners should keep their minds open on the subject, and should call for surgical assistance as early as possible. The real difficulty is in making an early diagnosis, but as it becomes more the custom to call in surgical assistance for pyloric obstruction without reference to its cause, it is to be hoped that many early cases of cancer will be recognised and relieved. It is remarkable that the radical operation in the hands of German surgeons gives positively a lower mortality than gastro-enterostomy, i.e. out of 563 cases of the latter operation, there were 216 deaths or a mortality of 38.36 per cent: while of 325 cases of pylorotomy, there were 104 deaths, giving a mortality of 32 per cent. Moreover, it must be remembered that surgeons complain that a large proportion of the mortality which has followed their operations for cancer has been due, not to those especial dangers against which surgeons must guard their patients, but to want of strength on the part of the patient to support the operation."

Deaver and Pfeiffer (40) writing on Surgery
of/

of the Stomach, under Carcinoma of the Stomach give Mayo's review of -

"266 partial gastrectomies with thirty-four deaths, an average mortality of 12.4 per cent. The total number of excisions for carcinoma of the pylorus was 224. Fifty of these had been operated on over five years ago. It was possible to trace 39, 7 of whom had remained well for from five years to eight years two and a half months Of 85 patients operated on over four years ago, 64 were traced, 13 of whom were alive and well. Of 117 who had passed three years after operation, 88 were traced, 18 being alive and well. . . ."

He lays stress on the fact that -

"to secure the best results the disease must be removed before the lymphatics are infected."

Gray (41), writing on the Treatment of Cancer of the Stomach, says: -

"the only excuse, and this a most questionable one, for a physician refraining from handing an early operable case of gastric cancer to the care of a reliable surgeon, is that the physician is influenced by the results of surgical interference of twenty/

twenty or thirty years ago, and that he has not taken the trouble to know what present-day surgery can do. The ultimate results are worst in those cases in which a limited operation was done. patients stand excision better than gastro-enterostomy. In any kind of cancer the ease and thoroughness of removal of the lymphatic areas in connection with the part affected indicate the probability of ultimate cure. coming to actual recorded facts," he says, talking of operative results, - "one finds great encouragement. Statistics published during the last decade show an average mortality from the operation of 26.5 per cent. In the last five years this has been reduced to just over 10 per cent. In the practice of the best surgeons it is probably below this. (One must bear in mind that without operation the mortality is 100 per cent., death occurring in a few months). . . . Mr. H. J. Paterson, in 1906. collected 86 cases which recovered from the operation. There were 21 of these alive and well three years, and 12 five years, afterwards. He failed to trace 7 cases. Such records/

records, surely, ought to justify strong recommendations to early operative interference.

Some of the most favourable cases are those with large tumours. I think when a tumour is movable it is possibly removable. Benign ulcer of the stomach is the great predisposing cause of cancer of the stomach cancer of the stomach is increasing at an alarming rate in spite of improved medical treatment of its greatest predisposing cause - benign ulcer of the stomach.

Records of weight taken at regular and short intervals are of great importance. I know of no other disease in which the physician and the surgeon can work together with greater benefit.

It is not permissible to wait until a certain diagnosis can be established before interfering by operation, as in most cases this will be too late for radical cure. I think a month spent in uncertainty is more than ample. One should then make an exploration to make certain. Of course, even though exploratory laparotomy is so safe now-a-days, please do not imagine that I think it should be undertaken lightly. There should be weighty, well-thought/

thought-out reasons for anxiety in the case before it is undertaken, but one must remember that, as Dr. W. J. Mayo has so ably insisted, exploratory incision is the only way that early diagnosis can be established. . . . In conclusion, it must be acknowledged that without exploration the diagnosis is an extremely difficult matter, and that the practitioner who undertakes the diagnosis (or want of it) unaided accepts a very great responsibility. Hence I urge more collaboration."

Hale White (2) says: -

"Although the counsel of perfection is to excise very early and even to perform an exploratory operation with a view of seeing if a growth be present, yet in practice the percentage of cases suitable for excision is small. . . . The most successful and most recent series of cases is that recorded by Mayo, 18.1 per cent of his cases were alive and well three years after excision of the growth. Other operators have not been so fortunate."

Mayo Robson writes: -

"Up to the end of 1905 Kocher had performed 110 partial resections of the stomach with a mortality of/

of 24 per cent, but of the cases, fifty-eight in number, operated on since 1898, the mortality was only 15 per cent., a percentage closely corresponding to that of the brothers Mayo, who up to the end of last year had performed 100 gastrectomies with a mortality of 14 per cent.

"In my own practice since 1896, the mortality for partial gastrectomy has been 14 per cent., and Maydl's statistics give a 16 per cent. mortality.

"We may thus conclude that the immediate risks of partial gastrectomy, as calculated from a considerable series of cases, are between 14 and 16 per cent."

Moynihan (42) writes: -

"The origin and early development of cancer of the stomach are certainly insidious, but the growth is not usually rapid, and the involvement of the parts to an extent which excludes the possibility of removal by operation is probably tardy. What are the conditions, therefore, which make our treatment of the disease so ineffective?" he asks. "In the first place diagnosis is not made at a sufficiently early stage, and in the second we have too/

too often been contented with merely palliative operations instead of attempting the removal of the growth.

"We have heard much in recent years of the problem of the early diagnosis of cancer of the stomach; but, in spite of much labour and much discussion, no significant advance has been made in our power of a timely recognition of the disease. A close study of the history of the patients in my series and in the records with which I have made myself acquainted leaves me convinced that even with our present methods earlier recognition and radical surgical treatment based thereupon should be far more frequent than at present.

"But no one would hesitate to say that positive recognition of cancer of the stomach in its early stage - in the stage, that is, when it could be completely eradicated - is, with present clinical methods, almost impossible. If so it should be frankly admitted, and the only certain method - exploratory operation - be vindicated. If the clinical history of a case is such that suspicions created at the first are not quickly allayed, then the/

the abdomen should be opened to enable a diagnosis to be made. Exploration should be used for the purpose of making, not with the object of confirming a diagnosis. It is probable that, as in other matters, the comparison of the history and of the conditions revealed at operation will lead by degrees to greater assurance in our diagnosis. Before an exploratory operation is sanctioned, however, the clinical investigation, should be as complete as it is possible to make it."

In his 1909 paper, (23) he says: -

"The surgical treatment of cancer of the stomach is now based upon sound principles, as a result of the work of many labourers in different fields" and he holds that "the somewhat mournful view of the possibilities of the surgical treatment of cancer of the stomach taken by several writers are not justified."

Hey Groves (43) writes: -

"The subject of the radical treatment of cancer of the stomach by surgical operation is one on which a great deal of work has recently been done. And yet, owing chiefly to the long delay which occurs/

occurs before the cases are submitted to the surgeon, the immediate mortality is very high and the proportion of lasting cures is disappointingly low. It is my object to discuss the causes and remedies for this state of affairs and to support the following propositions:

1. There is a good prospect of cure in early cases of the disease.
2. That exploratory operations should be performed for diagnostic purposes in all doubtful cases."

He advises a two-stage operation, such tending to reduce the immediate operative mortality, and a more systematic attempt to remove the whole of the lymphatic area connected with the stomach. He gives the duration of symptoms before surgical treatment was called in on an average, (i.e. in his series), 7 months, and he says: -

"It is quite clear that in most cases a most unreasonable delay occurs before the surgeon is consulted, and this delay must often involve the growth becoming unfavourable for radical treatment. . . . In any doubtful case, a steady gaining of weight is in my opinion the only condition that renders/

renders a postponement of an exploratory operation justifiable." He refers to Makkas who "speaking of over 600 cases of cancer of the stomach, states that this sign of emaciation never failed."

From a series of figures collected by Goldschwend, he (i.e. Groves) argues "even in the hands of experienced operators the mortality of the operations for resection of cancer of the stomach is about 50 per cent. . . . This is caused by peritonitis, shock, and lung complications. . . . Remote results of radical operations only give a percentage of 7.6 three-year recoveries of those operated upon. This low figure may in part be due to the inadequate removal of lymphatic tissues." He gives a mortality of 16.6 per cent as that obtained by the two-stage operation.

Cheyne and Burghard (44) point out that of cases of non-obstructive cancer of the stomach coming under observation, there are very few in which extirpation with a fair prospect of cure can be carried out. "This is due to the fact that they are in the first instance watched for some time before being sent to the surgeon, largely no doubt because, when the/

the growth is small enough to be easily removed, no tumour can be felt from outside and the diagnosis is therefore uncertain." In cases obstructing the pylorus on the other hand, "operation is urgently called for owing to the inability of the stomach to pass on its contents, and on account of this the surgeon is frequently called in at a comparatively early stage of the disease." Contra-indications to radical operation, they hold, are extensive disease, great glandular involvement, numerous adhesions and a feeble condition of the patient. "It must never be forgotten that pylorotomy is a severe operation which the surgeon is not justified in performing unless the lesion be so limited that there is a reasonable prospect of a cure."

With regard to my cases, I intend merely to state the details of the treatment carried out and the results accruing therefrom. I will not enter into the type of operation employed for this is an exclusively surgical matter, and there is, of course, no rule as to methods of procedure, each case being treated according to the appearances seen on laparotomy. Radical gastric operations can be successfully/

successfully carried out in a great number of cases even at a comparatively late stage. The names of Billroth, Kocher, Mikulicz, Kronlein and Connor are associated with such operations, Mayo Robson stating that the first successful operation was performed by Billroth, on February 28th, 1881. This is thirty-one years ago, and it must be regarded as a remarkable fact that considering this lengthy period, the results are not more favourable than they are. I am convinced that if the impression, deeply engraven in the minds of a great number of the profession - that gastric carcinoma cannot exist unless a tumour be present - were erased, and a more important impression substituted - that a tumour should never be waited for - the results would materially improve. Many cases appear to be only a month or so too late for radical treatment to be carried out, because time has been spent in waiting for, or looking for a tumour.

Appended is a statement showing the treatment carried out, and the results obtained.

"GASTRIC/

"GASTRIC." "PYLORIC." TOTAL.

NUMBER OF OPERATIONS, i.e., Exploratory laparotomy.	48	141	189
(1) Inoperable.*	41	89	130
(2) Considered removable and excision performed.	7	52	59
Of those considered removable: -			
Died in hospital. i.e., Immediate operative mortality.	4	25	29
Left hospital relieved or otherwise.	3	27	30

It will be seen that: -

In 11 cases of my series of 200, no operation of any kind was attempted owing to the advanced stage of the disease.

The/

*Of those cases in which operation was resorted to - about 68.8% were inoperable, either a merely palliative operation being carried out, or the abdomen at once closed. About 31.2% were thus considered removable and excision performed. Of the latter, there was an immediate operative mortality of 49.1%.

The usual duration of life after a palliative operation e.g., gastro-enterostomy, was about six months, and after a mere exploration, two or three months. After an excision, it varied considerably, depending probably on the successful or unsuccessful lymphatic removal.

The "gastric" cases who left hospital were 3 in number. The ages at operation were 32, 45 and 51. The operations were performed in 1896, 1899 and 1905. The second of these was alive and well on November 13th, 1911, when I had the good fortune to see him. He was practically two stones heavier than in 1899, i.e., 12 years before. Partial gastrectomy for a carcinomatous mass in the middle of the stomach, had been performed. There was glandular involvement also. End to end suture was executed. I was interested in the subject of free hydrochloric acid, there having been none at the operation (in 1899). I therefore gave him a test-meal, and on passing the tube 1 hour later, found that there were no gastric contents to recover. Doubt has arisen as to whether a period of three or five years freedom from signs of recurrence constitutes a cure. With regard to this case/

case, in which a period of more than twelve years had elapsed, there can be little doubt of his cure. The after-history of the other two cases is lacking.

Of the 27 "pyloric" cases who left hospital, after-history is lacking in 10. Death from recurrence of the disease occurred in 5, the periods after operation being 5 months, 9 months, 14 & 16 months & 2 years. Death from other causes occurred in 3. The periods after operation were 2 months (empyema); 4 months (pneumonia); and 7 years (uraemia). This last case developed prostatic symptoms (aet 63) and died as stated of uraemia. A post-mortem examination revealed no trace of disease in the gastric region where a Billroth II operation had been performed. Two patients reported with inoperable recurrences 10 and 12 months later respectively.

Seven patients were alive and well at varying periods after operation as follows: - 3 months, 10 months, 12 months, 13 months, 14 months, 5 years and 15 years. The last named, in September 1896 when aged 62, was operated upon for a pyloric carcinoma with glandular involvement. Kocher's pylorectomy was performed. I saw this patient on October 30th/

30th, 1911, in excellent health though aged 78. His cure is undoubted.

The greater number of immediate deaths were due to shock, pulmonary complications, and peritonitis. If a patient survived the first week after operation, he was usually safe. Hemorrhage as a rule never gave cause for anxiety. Fat necrosis occurred in three cases in my series. Splenic infarcts were found in three cases. Uraemic symptoms due to renal disease occurred in three cases causing death. In one case, the blood supply of the transverse colon had been interfered with, and in another there was a prolapse of the jejunum through the transverse meso-colon. To have good surgical results, good material must be provided to operate upon.

GENERAL/

GENERAL CONCLUSIONS.

1. Gastric Cancer is probably the commonest form of malignant growth occurring in males. Perhaps with the exception of the uterus and breast, it is also the most common form of malignant growth in females. It is all important therefore that greater attention should be given to its early recognition.
2. Females are far more frequently affected than text-books would lead one to imagine.
3. Gastric Cancer is not so much a disease of middle age as one would be led to believe, a marked percentage of cases occurring under 40. The prevalence of the belief that it is a disease of middle age has often led to disastrous results in the diagnosis of the disease under 40.
4. Heredity, in some cases, plays an important rôle in etiology. When present, it is usually markedly/

markedly so.

5. All cases of gastric ulcer, healed or unhealed, are potential carcinomata.

Alcohol, by acting as an irritant, may cause ulceration and later carcinoma, or it may cause carcinoma a priori. Oral sepsis and carious teeth probably are important factors also.

6. "Pyloric" carcinomata are more common than "Gastric". As a rule the former give more definite signs. They should accordingly be more easily diagnosed, and as they lend themselves more readily to excision, operative results should be accordingly brighter.

7. Gastric disturbance in a person of over 45 should always arouse suspicion and be considered seriously. Unless definite improvement occurs in 3 or 4 weeks under medical treatment, such cases should be dealt with surgically.

8. Systematic weighing in all gastric cases should be more commonly practised, carcinoma being marked by a steady decrease in body-weight.

9. Anaemia being marked in most cases only towards the close, blood examination is probably useless as a help to early diagnosis.
10. Like anaemia, subnormal temperature also is probably a late occurrence.
11. Constipation is a marked feature in practically every case of carcinoma of the stomach. But its occurrence is so common, even in health, that it must only be awarded secondary consideration.
12. Anorexia as a symptom is of the greatest importance - especially if occurring over 45 in a person previously healthy - all the more so if it be accompanied by a feeling of load or weight in the epigastrium after food, by eructations, water-brash, and heartburn.
13. Vomiting and haemorrhage as symptoms are too often late occurrences to be of value in diagnosis in the early stages.
14. Pain is an almost invariable early symptom.

15. Examination of test-meals should be more commonly performed. On the results obtained, however, reliance can be placed only in the late stages. In the early stages they may support a doubtful diagnosis.
16. Careful abdominal examination is essential. It must be leisurely performed, and frequently repeated.
17. The presence of a tumour above the umbilicus should be a signal for immediate action, provided the bowels have been cleared out, and a splenic or hepatic origin excluded.
18. Scientific tests should be more generally resorted to. The disease, however, first comes under the notice of the ordinary practitioner who in many cases, unfortunately, lacks both the time and the facilities for the attendant investigations. In most cases, scientific tests are applied and results drawn therefrom only when the disease is clinically almost unmistakable.

19. Cases in the past have been sent to the surgeon much too late - a fact clearly brought out by the relatively small number in which a radical operation was possible.
20. The only cure at present is a surgical one, and the mere prolongation of life is possible only through surgical intervention.
21. All cases of doubtful gastric disorder, therefore, should be submitted to a careful examination, first without, and later (if necessary) under a general anaesthetic. This applies both to chronic cases, and to cases occurring in persons over 45 with a previously clean gastric history.

If, thereafter, doubt exists, the situation being clearly and definitely described to the patient and his friends, a surgeon should be consulted. With the surgeon eventually must the issue lie. Only by the collaboration of physician and surgeon will an early diagnosis be arrived at, and a consequent radical treatment be rendered possible.

I cannot take leave of the subject without once again expressing my obligations to Mr. Caird for his generosity in placing so much valuable material at my disposal. I feel, too, I must further express my gratitude to Professor Wyllie and to Professor Caird for the valuable teaching imparted by them, and for the wide insight I was privileged to acquire as Resident in their wards.

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